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PHYSICIAN TO UNIVERSITY COLLEGE HOSPITAL.

LECTURE III.*

(Delivered on June 12th.)

I HAVE classified the symptoms of functional disorder of the stomach into three fundamental groups or syndromes and connected each group with a different part of the gastric mechanism. I shall now consider what alterations in this mechanism are responsible for the production of these symptom groups and what are the causes of these alterations.

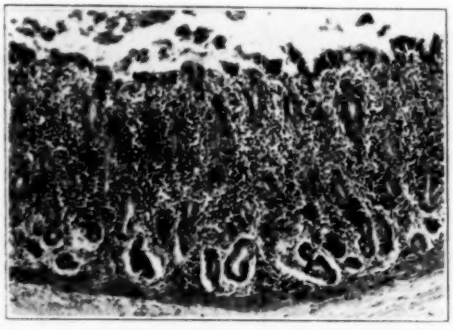
A. PYLORIC SYNDROME.

The changes producing this group of symptoms are due to irritability of the pyloric sphincter which produces its effects in the later stages of digestion when the stomach is partially empty and its contents are most irritating. The normal relaxation of the sphincter is interfered with and ultimately it becomes spasmodic, the spasm involving the pyloric vestibule or only the end of it; its two functions whereby it acts as regulator of the output of food and of the acidity of the gastric contents are upset, so that delayed emptying of the stomach and hyperacidity of its contents result.

Causes.

1. *Indigestible and Irritating Food.*—The normal movements of the pyloric sphincter are effected by local reflexes through the myenteric plexus. It is not thoroughly understood how this is accomplished. The character of the food is probably one of the chief factors, for the pylorus has undoubtedly a selective action. It separates the fluids from the solids and holds up those portions which require further disintegration. The constant ingestion of food difficult to disintegrate, particularly if bolted and containing irritants, leads to deficient relaxation of the pylorus through excessive irritability, which, once established, tends to persist.

FIG. 1.



Section of monkey's stomach showing gastritis. There is round-celled infiltration of the mucosa and destruction of the gastric glands (HCl experiments).

2. *Hyperacidity of the gastric contents* resulting from this pyloric hypertension or hypersecretion increases and maintains the pyloric irritability and finally produces spasm, for Cannon [1] has shown that the HCl of the gastric juice is at all events a factor in the control of the pylorus, so that there can be no doubt that the myenteric reflex responsible for this control is very sensitive to HCl, and in the presence of an excess produces pyloric spasm when it is irritable.

3. The facility with which these effects are produced depends upon the condition of the nervous system as regards stability. There are three conditions which tend to render unstable the reflex mechanism controlling the pylorus.

FIG. 2.

Section of monkey's stomach showing an enlarged follicle bursting on the surface and forming a follicular ulcer (HCl experiment).

(*a*) A direct effect upon the *myenteric plexus* itself. This effect is produced by a *chronic ulcer* situated in the pyloric vestibule, especially if near the pylorus, or a duodenal ulcer. An acute ulcer, although there may be nerves exposed in its base, produces no characteristic symptoms; it is the chronic ulcer which acts as a focus of irritation to the part of the stomach in which it is situated. The wall of the moderately stretched stomach is only about 4 mm. thick, and it is therefore rapidly destroyed during the formation of an ulcer. The muscular coat retracts in all directions and the base of the ulcer is formed of newly formed fibrous tissue or some adjacent organ. There are no nerves in this base to be irritated by the gastric contents except such extrinsic nerves as may by chance be caught up outside the stomach. The fibrous base of the ulcer extends in all directions into the surrounding wall of the stomach between and involving its coats by a slowly progressive type of chronic inflammation; it gradually infiltrates the myenteric plexus and the endings of the extrinsic nerves, and it is only reasonable to assume that it acts as a focus of irritation to the plexus, whose function is to coördinate the movements of the different parts of the stomach. It is not common for a *cancer of the pylorus* to produce this effect, although now and again such an event occurs.

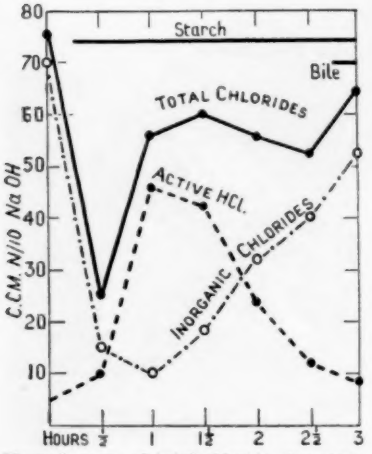
Pyloric gastritis is held by Faber, of Copenhagen,[2] to be a cause of pyloric symptoms, because he has found this condition in the resected parts of patients who have been operated on for supposed ulcer, and who showed pyloric symptoms. He is doubtful, however, how often hyperchlorhydria can be referred to gastritis. Gastritis in this position is common enough, and I suggest that it may be a secondary result of the hyperchlorhydria. In 1915 [3] I was able to produce gastritis and follicular ulcers by feeding monkeys daily with HCl solutions of 0·28 per cent. and upwards (Figs. 1 and 2). In no case did the ulcers show any tendency to extend or become chronic. So that the primary event may be pyloric irritability or hypersecretion, and the secondary results hyperchlorhydria and gastritis.

(*b*) The second condition which renders the pyloric mechanism unstable is *reflex irritation*. According to Cannon's [1] experiments of intestinal section and irritation of the colon pyloric hypertension should result from disease of the bowel as a reflex effect. Moynihan [4] first described pyloric spasm, that is to

* Lectures I. and II. appeared in THE LANCET of June 9th and 16th respectively.

say of the sphincter, and also the pyloric vestibule, as being secondary to appendicitis, and Cole [5] and Barclay [6] were early X ray observers who noted the same condition as the result of various conditions in different parts of the bowel by the X rays. Since this time numerous later observers have described similar findings. Carlson and Litt [7] find that stimulation of any visceral afferent nerve may cause spasm of the pylorus through the splanchnics. In the present state of our knowledge regarding this difficult subject we must conclude that reflex irritation from some other part of the alimentary system is a cause of pyloric irritability.

FIG. 3.



Normal curve of total chloride, inorganic chloride, and active hydrochloric acid.

(*c*) Finally, any condition rendering the *central nervous system unstable* is a factor in contributing to produce pyloric irritability. The effects of neurasthenia and other forms of nervous disorder, however, are much less marked upon the pyloric sphincter than upon the body of the stomach, and are not so often a primary cause of the disturbance, although once established they no doubt perpetuate it.

Effects Produced.

Whatever is the primary cause of the pyloric irritability is a matter of little moment; the effects produced are the same in each case.

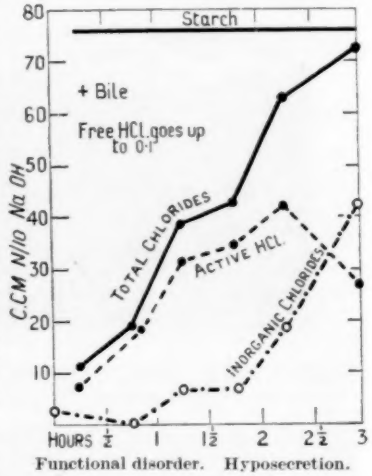
1. The pylorus is first interfered with in its capacity as *regulator of the output of food*. When the stomach is filled with food the pylorus assumes its condition of postural contraction, whereby it locks the food in the stomach and yet there is no increase in the contraction tension of its muscle fibres. Expulsive peristalsis begins at once about the middle of the stomach and from this point waves pass over the pyloric portion without ceasing, and increase in vigour as the stomach empties. These waves deepen towards their termination, a constant central stream of gastric contents flowing backwards, and the deeper the waves the more forcible the velocity of this backward current. The pyloric sphincter in its state of postural tonus determines the rate at which food leaves the stomach. It does not relax before every peristaltic wave, neither does it always relax to an equal degree. At the beginning of digestion it relaxes just enough to allow liquids and finely divided solids to pass out, pieces of food difficult to disintegrate, hard masses, and irritant material are shot back into the pyloric vestibule to undergo further softening and subdivision. In this way the pylorus exhibits its function of selecting properly prepared food—namely, that in solution, finely emulsified and disintegrated, and partially digested to be passed on to the intestines. The different foodstuffs leave the stomach at different rates. The pylorus may hold up indigestible material for a considerable time, because it is a common experience for patients to complain that they have vomited easily recognisable articles 24 or more hours after ingestion, although they have eaten other food in the meanwhile which has passed out of the stomach; or such indigestible residue may be washed out after everything else has left the stomach

The gastric contents thus become more irritating as digestion proceeds, because the soluble and easily disintegrated food has passed out of the stomach, leaving the more irritating portions behind mixed with gastric juice. If food difficult of disintegration or irritating is eaten the factors tending to bring about pyloric relaxation become less effective as digestion proceeds; the pylorus refuses to relax and finally becomes spasmodic. Whether the pylorus is initially irritable or becomes so as the result of irritating food during digestion makes no difference. The result is the same. Peristalsis increases in vigour as in the case of all opposed muscles, and the tonic contractions of the body become more pronounced, so that the internal pressure is raised, and finally the pyloric vestibule becomes spasmodic with the sphincter.

If the stomach has emptied rapidly at the beginning, so that when pyloric spasm comes on very little is left in it, these exaggerated movements of the body are of precisely the same nature as the normal hunger contractions of the empty stomach, and the pain experienced owing to the pyloric spasm becomes blended with an empty, hungry sensation. If the gastric contents are of considerable volume when the spasm occurs the feeling is one of fullness. In either case referred pain may or may not appear in the region representing the body. As the cardiac sphincter relaxes from time to time regurgitation of the acid contents occurs into the œsophagus; this is more likely to appear if the volume of the gastric contents is considerable, or if its occurrence is favoured by the position of the patient, or the intra-abdominal pressure. The usual result is that the fluid causes a burning sensation in the throat, is re-swallowed, and a few deglutition movements clear the œsophagus; or the fluid if it reaches the mouth is spat out.

The further changes in the œsophagus will be described later, but marked œsophageal symptoms or wind eructations are by no means very common in the pyloric syndrome as the patients have not as a rule any special neuropathic tendency. When food is eaten the symptoms are put an end to because the muscular movements producing them are stopped, as I have described in the last lecture, and the cause is removed — that is to say, the acid contents of the stomach are diluted and neutralised.

FIG. 4.



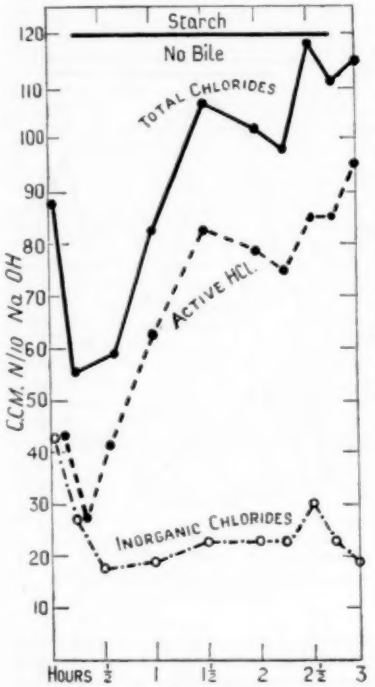
Functional disorder. Hyposecretion.

It was demonstrated by Carlson [8] that the hunger contractions of the empty stomach are inhibited by the introduction of food, the organ assuming its condition of postural contraction. Moreover the chewing and swallowing of food may also inhibit them. It is a well-known fact that immediate relief by food is best obtained in those cases of pain with hunger which occur when the stomach is relatively empty and also that quite a small amount of food, such as a biscuit, will relieve; in these cases also relief by alkalis is more complete. These two facts receive this explanation, in that inhibition is more effective when the stomach is almost empty, for the later the symptoms commence the less irritable is the stomach and the more easy to relax, and neutralisation of more importance since the HCl is an important factor in causing the spasm. Œsophageal symptoms in such

cases can usually be easily overcome by washing the œsophagus by swallowing water.

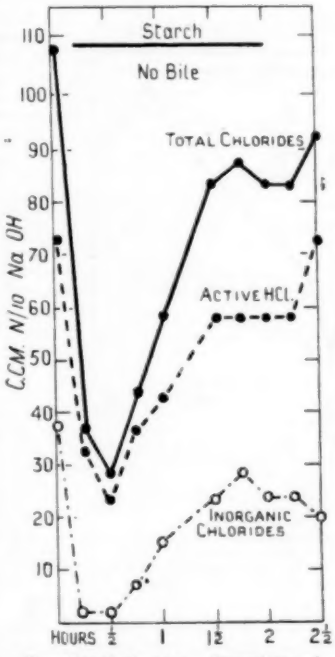
It is easy to understand the relaxation of the body and pyloric vestibule, but one difficulty presents itself, and that is why the pyloric sphincter itself is relaxed by food. If entirely dependent upon the acidity it will relax when this is neutralised, but it is probable that the sympathetic, which relaxes the stomach and closes the sphincter, is able to induce in the latter the through the myenteric plexus or vagus; and Carlson[7] has shown that pyloric spasm may be reduced by stimulation of the sympathetic. When the extrinsic nerves are the original cause of the irritability similar effects must be seen in a more irregular and complicated fashion. It is not so common for pyloric irritability to be directly due to instability of the central nervous system, but as a reflex effect through the sympathetic from other portions of the alimentary

FIG. 5.



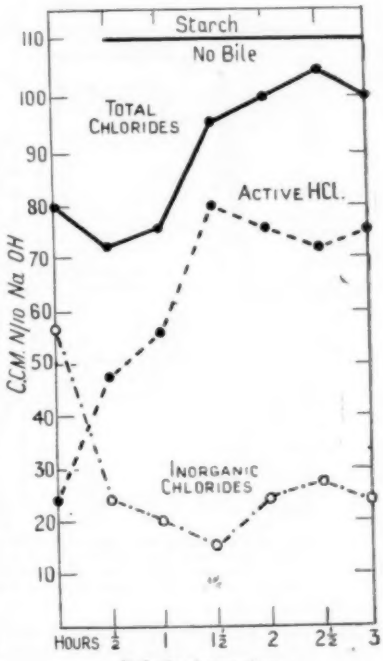
Duodenal ulcer.

FIG. 6.



Functional disorder. Symptoms of hyperchlorhydria.

FIG. 7.



Pyloric obstruction.

condition of postural tonus when it is spasmodic. We do not really understand the precise action of the extrinsic nerves of the stomach. The vagus is the motor and the sympathetic the inhibitory nerve; but either will produce spasm or relaxation of either sphincter. The result depends upon the strength of stimulation and the stage of digestion, or the condition of muscular contraction at the time. If spasmodic a sphincter will be relaxed, if relaxed it will contract (Carlson). As the stomach is filled the vagus relaxes the cardia and body of the stomach during swallowing food so that pain is rarely experienced during the meal; during the emptying it increases the tone and peristaltic contractions of the stomach and tends to relax the pylorus, thereby increasing the emptying efficiency[9]; excessive stimulation causes spasm of the pyloric and relaxation of the cardiac end.

So that in this condition of pyloric irritability due to improper food or local irritation as in duodenal ulcer and starting as an excess of the local pyloric reflex through the myenteric plexus, the vagus reflex is no doubt in many cases unduly excited and called in to aid in the increased peristalsis and tone of the stomach, but, when excessively stimulated it induces, or at all events increases, the pyloric spasm—that is to say, of the sphincter and vestibule. In favour of this view is the early rapid emptying of many of these stomachs, the hypersecretion which is not uncommon, and the effect of atropine in often relaxing the sphincter. The action of the sympathetic, when food is eaten, is to inhibit these effects more or less successfully and to reduce the pyloric spasm to the condition of postural tonus when it is due to overaction

canal it is, as we have seen, common enough. In such a case relaxation of the sphincter by the sympathetic cannot be expected so that the symptoms would not be so well relieved by food, and in his original description of this reflex dyspepsia Moynihan points out that the gastric pain in this condition differs from that of gastric ulcer in not appearing so regularly at a fixed time after food and having no fixed interval of relief after a meal.

The final stage of this interference with pyloric action, which is seen on occasion, is one in which muscular insufficiency appears and the stomach shows slight dilatation. This condition, which may be recognised now and again by the X rays, is easily recovered from and causes little alteration in the symptoms. All the muscular disorders described above may be seen on occasion by the X rays, but a series of cases cannot be followed through from beginning to end, otherwise our difficulties would be at an end.

2. The next function of the pylorus to be interfered with is that of *regulator of the acidity of the gastric contents*. It accomplishes this by relaxing and permitting the regurgitation of alkaline duodenal contents into the stomach at a certain stage of digestion. As this process has recently been denied I must give a brief description of the foundations upon which it is based, and point out how its opponents have fallen into error.

The first observer to recognise bile in the stomach was Beaumont,[10] but no significance was attached to its presence till Boldyreff's experiments[11] clearly established the fact and demonstrated the importance

of regurgitation of pancreatic and intestinal juices and bile into the stomach. He showed this spontaneous regurgitation into the empty stomach of both the dog and man; also that regurgitation occurred when fats were introduced into the stomach by mouth or through a gastric fistula; and that regurgitation of these juices was brought about when large quantities of HCl or other acids were introduced into the fasting or digesting stomach. He proved conclusively that the introduced acid was neutralised by the pancreatic juice regurgitated, showing that the reduction of acidity was due neither to absorption of acid by the stomach nor to dilution of the acid by any watery secretion. He considered that this process of regurgitation neutralised the acidity of the gastric contents down to 0·15 per cent. to secure the optimum acidity for digestion by pepsin and to protect the intestine. He styled the process the "self regulation of the acidity of the gastric contents."

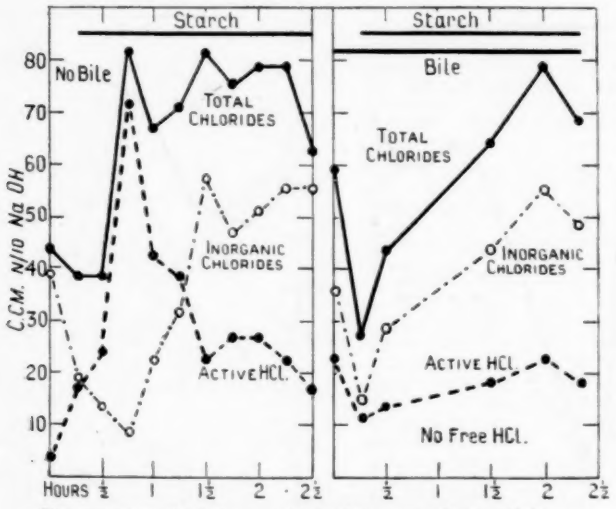
The only link needed to complete this chain of evidence was the demonstration that the process normally occurred in man during digestion. In 1914 Rehfuss [12] in America introduced the method of fractional analysis of the gastric contents into clinical practice and thus afforded the means of studying the course of events in the chemical process of digestion in man, and his example was first followed by Ryle in England in 1920. I may say at the outset that these observers and all who had worked with this method recognised the principle enunciated by Boldyreff of duodenal regurgitation. For example, in 1916 Spencer, Myer, Rehfuss, and Hawk [13] confirmed Boldyreff's findings of trypsin in the stomach, and in 1921 Rehfuss and Hawk [14] stated that during gastric digestion the pylorus shows heightened tonus with but little regurgitation, except that which is essential to maintain optimum acidity in the stomach, but that during the resting phase the pylorus relaxes, permitting a ready reflex of alkaline duodenal secretion. In the same year Bennett and Ryle [15] also subscribed to this theory of duodenal regurgitation, and concluded that the acidity of the gastric contents depends upon the balance between acid and alkali. Now according to the teaching of Rehfuss, the curves of free HCl and total acidity represented the course of gastric secretion. Isosecretory curves were those whose peak rose to a maximum of about 0·2 per cent. and comprised, according to Bennett and Ryle, about 91 per cent. of the total; hypersecretory and hyposecretory curves those which reached higher than or failed to reach the isosecretory level; if the curve did not descend or continue to rise, so that its highest point was reached when the stomach was empty, it was styled by Bennett and Ryle the "climbing type" of curve and occurred in about 5 per cent. of healthy people.

In 1921 Goodhart and myself [16] commenced the study of these curves. Our argument was that the curve of acidity of the gastric contents could not possibly mean the same thing as the curve of secretion. If secretion continued at the same strength till the stomach was empty the curve of acidity would be of the climbing type, and if secretion completely stopped when the top of the peak was reached the concentration of the gastric contents would remain at that level and the rest of the curve would draw a horizontal line. If the gastric juice fell off in acidity the curve would lie between these two levels. Rosemann, to whose work I shall refer later, had shown that such a fall in acidity of the gastric juice did actually occur; but the lowest percentage of HCl reached was 0·319, so that it was impossible for the gastric juice to act as a diluent, since the average height of acidity of the gastric contents was in the region of 0·2 per cent. HCl.

The only other condition which would bring down the curve of acidity of the gastric contents was neutralisation, for absorption of acid had been excluded as the cause. We made complete chloride estimations every quarter of an hour and found that as the acid curve went up that of neutral chloride remained low, and as the percentage of acid fell that of neutral chloride increased pari passu, the total chloride curve remaining unaffected (Fig. 3). It was also found that in cases of diminished secretion the total chloride curve was low (Fig. 4). We concluded that the real secretory curve was not the acid curve as described, but followed that of the total chlorides, and that the acid curve represented the progress of the neutralisation process only, which in its turn entirely depended upon relaxation of the pyloric sphincter at a certain stage of digestion, permitting of duodenal regurgitation.

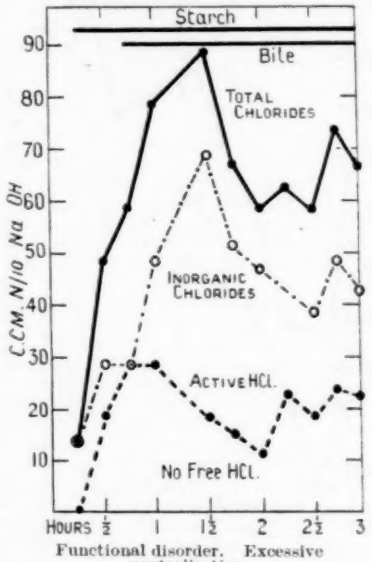
These results have been confirmed by Apperly,[17] by Baird, Campbell, and Hern [18] and by Roberts.[19] We have formed the definite hypothesis that in the condition of pyloric irritability the pylorus refuses to relax as described above at the usual time and the wave of neutralisation fails to appear. The further course of the curve depends upon the secretory

FIG. 8.



The curves on the left were obtained from a patient with hour-glass stomach (tube in the lower pole) before operation. The curves on the right were obtained from the same patient after partial gastrectomy, the jejunum being joined to the stomach.

FIG. 9.

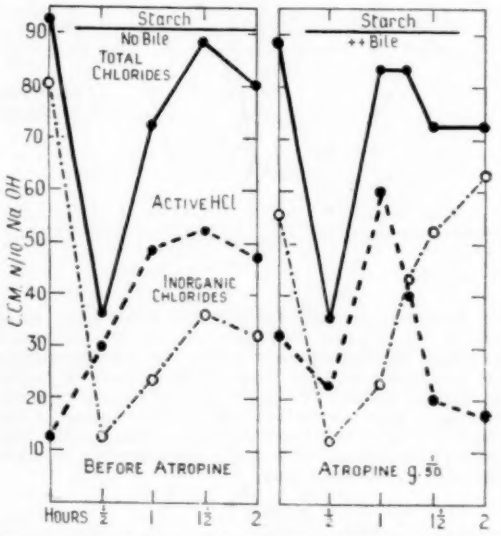


Functional disorder. Excessive neutralisation.

activity of the stomach and the behaviour of the pylorus. The acid curve may continue to rise as in the climbing type; or it may draw a horizontal line; or the pylorus may relax occasionally to different degrees and the acid curve fall with each relaxation to rise again as the pylorus tightens up. This in our opinion is the condition described as hyperchlorhydria or acid dyspepsia (Figs. 5 and 6).

We regard the following facts as being confirmatory of the conclusion at which we have arrived. (1) Bile appears in the stomach from the beginning in cases of excessive neutralisation, and frequently towards the end in normal neutralisation, although it is often absent. (2) In inorganic obstruction of the pylorus when regurgitation does not occur there is no evidence of neutralisation, the acid curve does not fall, but continues in its horizontal course (Fig. 7). (3) When the pylorus is cut out or gastro-enterostomy performed in such a case the total chloride curve remains of the same height as before, but achlorhydria is established by the free regurgitation of intestinal contents and bile is present in the stomach (Fig. 8). (4) In certain normal persons owing to excessive duodenal regurgitation the same condition of achlorhydria is established, with a normal height of the total chloride curve, and the constant presence of bile in the stomach (Fig. 9). (5) In certain cases of pyloric hypertension with absence of neutralisation the administration of atropine in addition to diminishing the secretion converts the climbing or horizontal curve into a normal one by dilating the pylorus and allowing a free regurgitation from the duodenum (Fig. 10). (6) In the condition of recovery from an attack of dyspepsia a normal curve obtained by the gruel meal may be converted into a climbing one by adding badly cooked split peas to the meal and so irritating the pylorus (Fig. 11). (7) The rapid ups and downs which

FIG. 10.

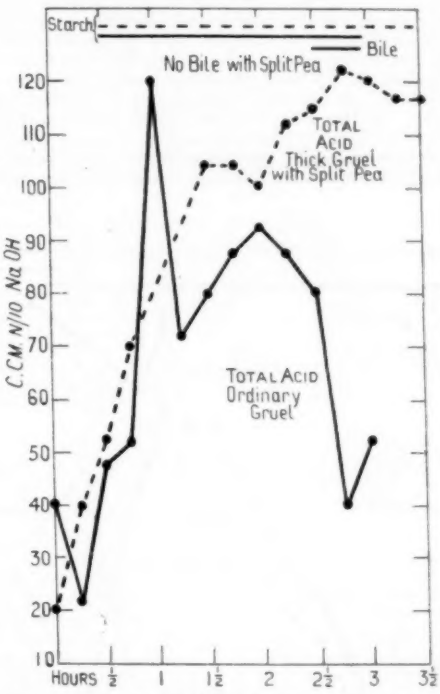


Curves obtained before and after administration of atropine.

sometimes occur in the curve can only be explained by the vagaries of a sphincter muscle (Figs. 12 and 13).

In our original paper dealing with duodenal regurgitation we stated that the curve of gastric secretion followed the course of the total chlorides, but did not assume that the percentages of Cl in the two were identical. The reason for this was that we realised that the HCl of the gastric juice might not account for the whole of the total chlorides present, because no exact data were available as to the amount of Cl in each of the other secretions. Hansman, Day, and Clifton [20] in a recent paper have calculated that the total amount of Cl present in the gastric contents is at times greater than can be accounted for by the Cl in the gastric juice, assuming that there are present certain proportions of mixed secretions each of known Cl percentage, and that the Cl secreted by the stomach is always in the form of acid. They have concluded that the stomach allows the passage of chlorides through the mucous membrane, and that

FIG. 11.



Curves showing amount of acid in gastric contents after a meal of (*a*) ordinary gruel, and (*b*) gruel thickened with split pea. The split pea has converted the curve into a climbing curve, prolonged the emptying time, and prevented regurgitation of bile.

neutralisation by duodenal regurgitation is only a contributory factor to the fall of acidity as the stomach empties. The gastric cell receives neutral chloride from the blood and transforms it into HCl, so that there can be little doubt that neutral chloride at times escapes this transformation in certain pathological conditions, but the hypothesis that this escape normally occurs at a stated time as a purposive act to reduce the amount of HCl by neutral chloride is certainly not justified, especially since the data upon which they rely are uncertain. Apperly [21] has, moreover, found that the chloride strength of the duodenal fluids may be enough to account for these chloride variations without invoking the aid of the passage of neutral chloride through the stomach wall, which idea he dismisses. This is borne out by Baird, Campbell, and Hern.[18] Roberts,[22] from observations upon the fasting juice, finds that the hypothesis of secretion of neutral chloride best explains his results, but admits that this explanation is only tentative owing to the number of uncontrollable factors present. It is true that the gastric juice obtained from the Pavlov fistula fluctuates in its degree of acidity, and Pavlov [23] himself has definitely proved that this fluctuation depends upon the rate of flow of the gastric juice, and the time it remains in the pouch; and that the cause of the low acidity is due to neutralisation when small amounts are secreted. The neutraliser is the alkaline mucus coating the surface of the mucous membrane, so that at the beginning of secretion the small amounts of juice trickling from the gastric tubes are neutralised,

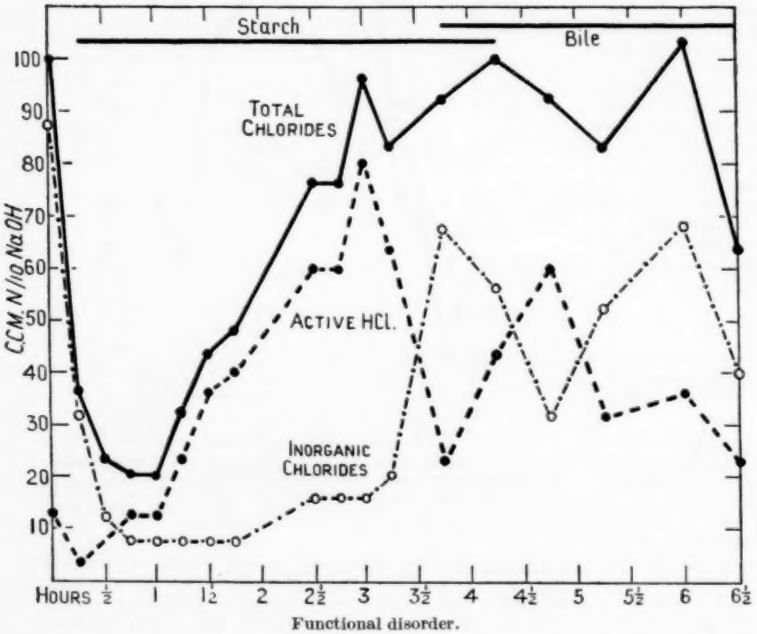
but this neutralisation process soon ceases to produce an effect as the secretion is fully established.

There can be no doubt that Pavlov is correct in his statement that the greater the quantity of juice the more rapidly will it flow over the stomach wall, and the less will it become neutralised, so that in the use of the Pavlov pouch allowance must be made for such variations in the acidity of the gastric juice when small amounts are secreted, because it has neutralising properties. The same process occurs on the subsidence of secretion, but Pavlov found that the low acidity, corresponding to a similar rate of outflow at the beginning of the experiment, was absent at this stage, and he has shown that not infrequently all connexion between rate of secretion and degree of acidity can be removed if the stomach has been well washed by ample secretion. He has also shown that by continued fictitious feeding the chlorides in the body may be so diminished that the feeding ceases to produce an effect; and yet the fluctuations of acidity in the samples of juice last secreted lie within normal limits. Although neutralisation is an important cause of fluctuations in the acidity of the gastric juice, at the same time Pavlov recognised the possibility of some other relation existing between the rate of secretion and the degree of acidity. With this idea in mind Rosemann,[24] in 1907, advanced the hypothesis that the amount of HCl, which the gastric cell forms from the total chloride supplied to it, depends upon its secretory energy, so that when this energy diminishes towards the end of secretion the HCl content of the gastric juice falls and the neutral chloride rises, so that the total chloride remains more or less constant. He did a large number of experiments with gastric fistulæ using the whole stomach and employing the method of sham feeding, the juice being collected every half hour. In no case did the acidity fall below 0·319 per cent., and it was usually not less than 0·45 per cent. after four or five hours. The greatest rise in neutral chloride was 0·22 per cent. These variations are very small, and may be described as being almost within normal limits as Pavlov described.

In 1915,[3] whilst studying the action of free HCl upon the connective tissue base of experimental gastric ulcer, I had occasion to use pilocarpine and did six acute experiments. I found that it produced a secretion of a dilute gastric juice of a constant acidity of 0·18 per cent. After the first hour the acidity percentage fell to 0·146, but even after seven hours it remained at 0·109. The acidity therefore fell somewhat as secretion proceeded.

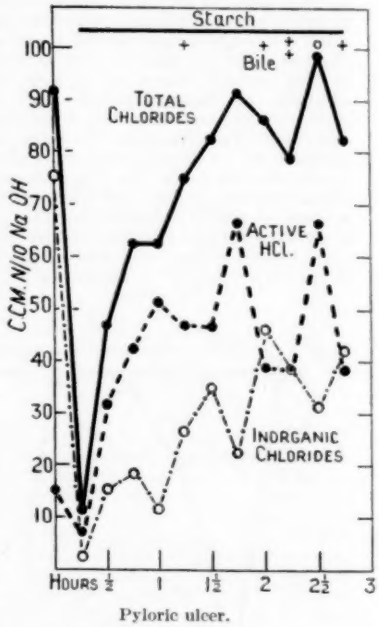
In 1921, at the commencement of our work with the fractional test-meal at University College Hospital, E. K. Martin and myself did some fistula work on cats. The idea was to collect the juice in fractions from the fistula whilst a fractional test-meal was in progress. We found that this was impracticable, because with the fluid meal we administered, although secretion might begin in fair amount, at the end of about an hour or a little more it sank to driblets of fluid and mucus. We therefore collected the juice from the beginning to the end of each experiment. I quote five experiments (Table I.). The figures show the average percentage composition of the juice collected over each period of time. They all show a gastric juice varying little from the normal acidity and containing small amounts of neutral chloride of about the same percentage as that usually given for normal gastric juice, whatever was the stage of digestion reached in each case, as judged by the amount of residual gastric contents. Any variations in acidity apart from neutralisation must, therefore, have been small. The amounts of secretion were quite considerable in view of the size of the pouches.

FIG. 12.



Functional disorder.

FIG. 13.



Pyloric ulcer.

TABLE I.

Cat.	Meal.		Pavlov fistula.				Stomach contents.		
	Subst.	Amount (c.c.m.).	Time (hr.).	Amount (c.c.m.).	HCl.	Neutral Cl.	Amount (c.c.m.).	HCl.	Neutral Cl.
B	Bovril	30	½	1	0·378	0·07	?	0·165	0·255
A	"	65	1	?	0·432	0·086	Stomach empty.		
B	Glaxo	80	1	3	0·345	0·07	26	0·068	0·122
C	"	90	1	3	0·422	0·028	39·8	0·123	0·129
E	Meat	?	1½	5·05	0·556	0·092	?	0·093	0·115

It seems quite likely that there are two factors influencing the acidity of the gastric juice: (1) neutralisation at the beginning and end of secretion,

and (2) diminished formation of HCl after a time owing to lessened energy of secretion. The alterations in acidity are related to the rate of flow of the gastric juice, so that in all Pavlov experiments the amounts of juice secreted should be recorded. Such alterations vary from animal to animal, and in the majority of cases are not large, and occur at the beginning and toward the end of secretion. Within the last few weeks MacLean [25] has published two papers upon this subject. He has produced Pavlov fistulæ in two dogs and collected the juice from them every half hour during digestion. He shows two curves of acidity. He has obtained a juice containing a constant percentage of total chloride throughout the experiment, so that as the percentage acidity rises to its maximum that of the neutral chloride falls, and as the secretion subsides the fall in acidity is accompanied by a rise in neutral chloride percentage. At the beginning and end of secretion there are only very small quantities of juice, so that an analysis cannot be made, and he assumes that at these periods the secreted juice consists of sodium chloride almost entirely. The important difference between his observations and those of others is that the fall in acidity he obtains as the secretion subsides is greater, so that at the end of three hours the percentage acidity stands in the region of 0·2. His explanation is that during the rise of secretion the sodium chloride changes into HCl, and during its subsidence this process gradually ceases so that the HCl is replaced by neutral chloride. This subsidence he regards as due to the inhibitory effect which HCl in the stomach produces upon the further secretion of HCl. There is no mention of the amounts secreted nor of neutralisation by mucus at any stage of secretion and however small an amount of juice is secreted. This explanation of the process of gastric secretion cannot, therefore, be accepted as it stands without further investigation.

FIG. 14.

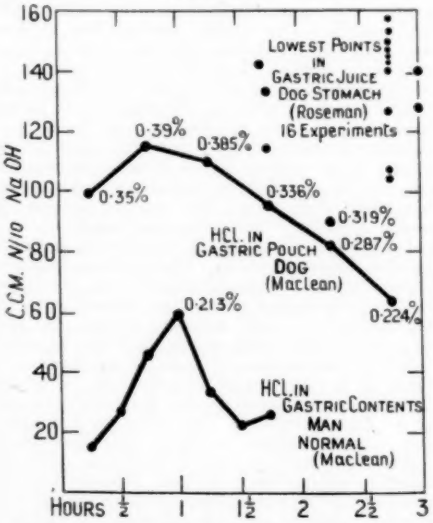
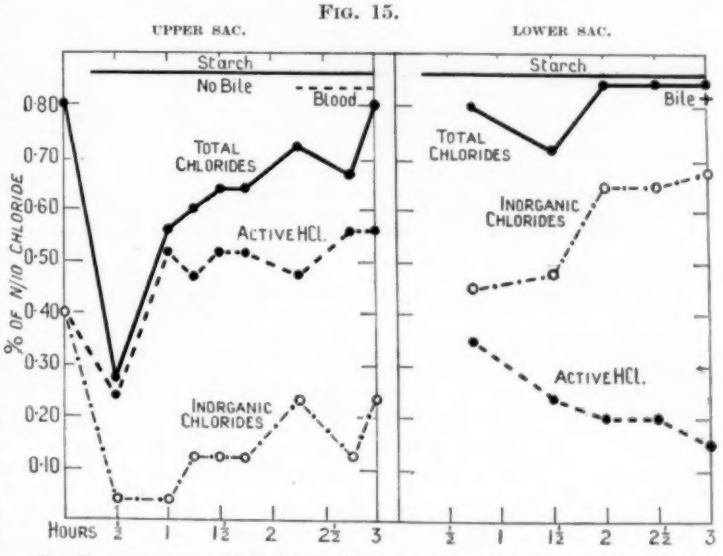


Chart comparing percentage of hydrochloric acid in (1) gastric contents after test-meal in man; (2) gastric juice from a Pavlov pouch in the dog; and (3) gastric juice from the whole stomach of the dog after a sham feed.

As regards the entirely *separate question of the acidity of the gastric contents*, MacLean regards the curves of this acidity as being produced by the same process as the secretory curves of gastric juice he gives. He considers that the reduction in acidity obtained by the fractional test-meal in the digesting stomach is due to the gradual replacement of HCl by neutral chloride and that duodenal regurgitation plays no part in it. Such a hypothesis is unlikely, because a replacement of acid by neutral chloride would only affect the acidity of the juice in process of secretion, and not that of the already existing gastric contents, the acidity of which can only be lowered by dilution or neutralisation.

FIG. 15.



Simultaneous curves obtained from the two portions of an hour-glass stomach.

1. The acid curve of the pouch is of the same shape as that obtained by the clinical test-meal, but it does not follow that they bear the same interpretation; on the contrary, it is clear that they must represent different processes since the conditions in each are different. The acid curve of gastric juice draining out of the empty stomach cannot mean the same as the acid curve of the contents of the digesting stomach. At the height of the acid curve in the digesting stomach when the fall is about to commence there is present a variable amount of gastric contents of an acidity of, say, 0·2, which will gradually leave the stomach in the next one or two hours or less. *If duodenal regurgitation be excluded* the only fluid mixing with the contents during this time is the gastric juice which is being secreted. The composition of this juice during the various half hours of digestion according to MacLean is as shown in Table II.

TABLE II.

Time after meal.	HCl.	NaCl.	Time after meal.	HCl.	NaCl.
½ hour	0·35	0·18	2 hours	0·34	0·19
1 „	0·39	0·13	2½ „	0·28	0·25
1½ „	0·38	0·14	3 „	0·22	0·28

At this stage of digestion very small amounts of gastric juice secreted.

Fig. 14 shows the acidity of the same gastric juice plotted out as a curve, below which is the curve of acidity of the gastric contents of a normal person; the dots represent the lowest points of gastric juice acidity in 16 experiments by Rosemann. It is clear that admixture of this juice with the gastric contents cannot result in any fall of acidity in the contents,

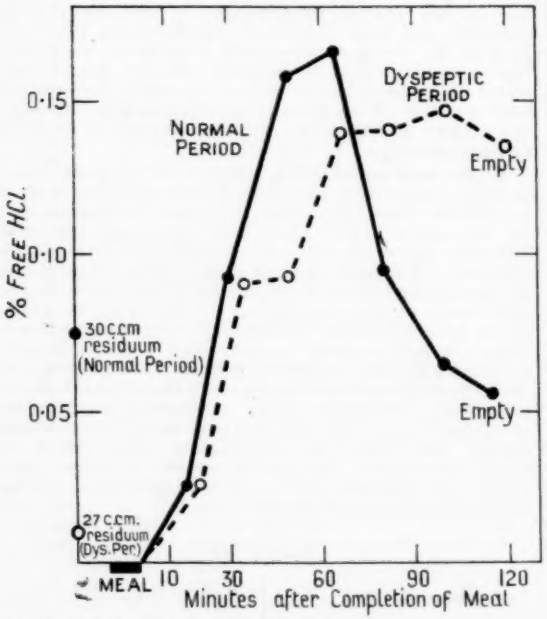
since the juice acidity is higher than the contents acidity all the time. Gastric juice, therefore, although it may contain an excess of neutral chloride, is unable to reduce the acidity of the gastric contents into which it is secreted, because its acidity is at all times greater than the contents acidity. Some other factor must therefore be held responsible for the fall in acidity of the contents, and this can only be neutralisation by regurgitation of alkaline duodenal juices. Otherwise the condition of acidity produced is the same as occurs in pyloric obstruction when regurgitation is prevented. The unaided gastric juice is not able to regulate the acidity of the gastric contents in the normally secreting stomach. This, of course, is simply a repetition of our original argument.

2. When the pylorus is obstructed, and regurgitation thus prevented, there is no trace whatever of any inhibition of HCl secretion by the continued presence of that acid, nor yet of its replacement by neutral chloride, since this curve in such cases is always comparatively low.

3. It not uncommonly happens in the clinical test-meal that as the acid curve rises the neutral chloride curve rises also, sometimes at a slower, sometimes at an equal, or less commonly at a quicker rate than the acid curve. According to this theory such a condition is impossible, because an increase of acid implies a decrease of neutral chloride, since the former is formed at the expense of the latter, and it is a necessary condition of the theory that the curve of neutral chloride should follow a path exactly opposite to that of the acid curve.

4. Finally we have proved this theory to be inapplicable to the digesting stomach by selecting for

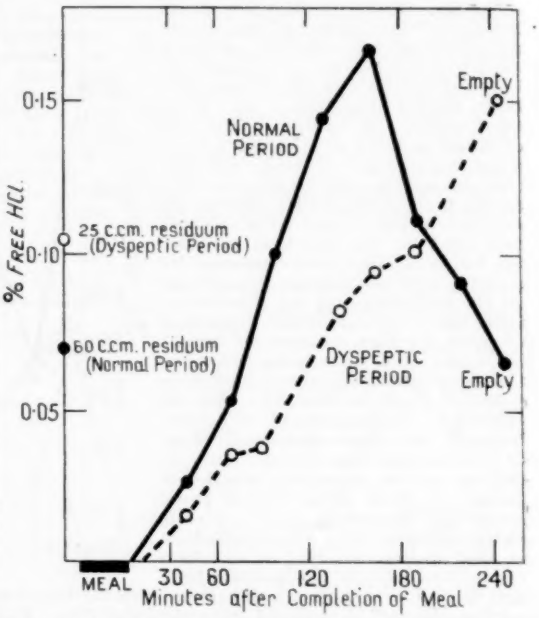
FIG. 16.



Hydrogen-ion concentration of gastric contents during digestion of test-meal (2 oz. oatmeal boiled in 1 pint of water) determined by quinhydrone electrode on samples of 1 c.cm.

observation an hour-glass stomach in which the constriction was situated about the middle of the body, so that there was ample secretion of normal acid gastric juice into both sacs. Two tubes were passed into the stomach under the X rays, one into the upper and one into the lower sac. From the upper sac we have obtained a curve of continuously high acidity with the very slight increase of 0·07 per cent. in the neutral chloride towards the end, and from the lower sac a curve of normal neutralisation. The tube in the lower sac did not work well at the beginning and an insufficient amount was extracted for reliable analysis, but the reaction of the fluid obtained was strongly acid. The fasting juice in the upper sac shows that some

FIG. 17.



Hydrogen-ion concentration of gastric contents during digestion of ordinary meal (chop 10 oz., including bone, potatoes 3 oz., tomato one, butter ½ oz., bread 3 oz., and water ½ pint) determined by quinhydrone electrode on samples of 1 c.cm. Note that the scale of the abscissa (time) is half that of Fig. 16.

neutralisation occurs in it in process of time (Fig. 15). It is clear that the upper part of the body cannot secrete HCl and the lower part neutral chloride; and it cannot be argued that the pyloric glands secreted the neutral chloride, because it is from the fundus that a Pavlov pouch is formed. Neither can it be said that the pyloric juice was the neutraliser, for it is of little importance in the neutralisation of the gastric contents, although in the empty stomach both pyloric juice and mucus are of considerable importance as neutralising agents when only small amounts of gastric juice are present. The only possible conclusion to be drawn is that the fall in the acid curve is due to neutralisation by duodenal regurgitation. The further evidence which MacLean brings forward seems to me to throw light upon a certain pathological type of gastric secretion in which neutral chloride appears to be put out from beginning to end of digestion, but curves such as he describes must be uncommon, as we have seen very few out of a very large number of investigations. The evidence available at the present time seems to point to the conclusion that neutral chloride under certain circumstances escapes transformation into HCl, and that the acidity of the gastric juice varies to a moderate extent with the rate of secretion after the fashion of the inorganic salts of the saliva, but such occurrences can in general only play a minor rôle in the regulation of the acidity of the gastric contents when the gastric secretion is normal.

The relaxation of the pylorus occurs at a definite time during digestion, varying in individual cases, and must be regarded as a definite link in the chain of events, which constitutes the normal digestive process. It is quite true, as Ryle[26] has pointed out, that in addition to pyloric relaxation there must also be a simultaneous adjustment of intragastric and intraduodenal pressures, so that the pressure in the pars

pylorica must fall below the pressure in the duodenum. In order to obtain more definite information of this process, therefore, Salmond and myself [27] have recently studied the movements of the duodenum as carefully as possible by the X rays in a series of normal persons, and also in patients suffering from functional disturbance only or in addition organic disease. We found that in 93 per cent. of the cases examined the duodenum exhibited to different degrees the movement of antiperistalsis, which we regard as being a normal condition. Sometimes this movement is definite and clear, sometimes it is ill-marked and indistinct, sometimes it is imperceptible. It has the effect of swinging back the food which frequently may be seen to distend the cap, being held up by the pylorus. Each food mass may swing backwards and forwards several times or once only; or the movement may be only occasionally seen. It occurs independently of duodenal or gastric peristalsis or relaxation of the pylorus, but the important point is that the duodenal cap is filled under pressure not only by the stomach, but also by the duodenum, and the only barrier to regurgitation into the stomach is the pyloric sphincter. Now it is quite clear that regurgitation cannot occur into the stomach when the pylorus relaxes before a gastric peristaltic wave, as the intragastric pressure rises to 30 cm. water or higher at this time, and the mean pressure in the duodenum is not higher than 10–15 cm. water (Marbaix [28]) or 14–20 cm. water (Payne and Poulton [29]). The mean intragastric pressure, however, is commonly below 10 cm. water, so that regurgitation could quite easily occur between peristaltic waves. We are bound to assume that in the early stage of digestion the pylorus relaxes only before gastric peristaltic waves, but that as digestion proceeds and the acidity attains its normal height, the pylorus begins to relax independently of peristalsis and if the cap is full at this time regurgitation back into the stomach occurs. That this is the case is evident from the fact that we observed regurgitation in six cases between gastric peristaltic waves, the food being seen to pass right back into the stomach through the cap owing to the impetus imparted to it by the second part of the duodenum. It is probable that this type of mass regurgitation only occurs when the pylorus happens to be open during a vigorous antiperistaltic wave.

In a later series of observations Salmond has noticed regurgitation of another kind, which is perhaps that most commonly occurring. This occurs during both a passive and an active phase of the cap. In the former whilst the cap remains distended and between peristaltic waves a thin stream of barium may be seen to run back into the stomach, in the latter a contraction of the cap beginning at the peripheral end produces the back-flow. At the present moment all that can be definitely stated is that the fact of regurgitation has been established by the X rays, but nothing more definite can be said about it. Antiperistalsis of the duodenum delays the food and holds it up in that structure, thereby establishing conditions favourable to regurgitation back into the stomach when the pylorus relaxes at a favourable moment. Apperly [31] has recently brought forward evidence to show that the control of the pylorus in thus permitting regurgitation ultimately depends upon the salt values of the duodenal fluids.

In the empty stomach the tone of the pyloric sphincter is low, and it may remain open for many minutes at a time, relaxing quite independently of peristalsis. The small amounts of gastric juice which are secreted are expelled periodically into the duodenum, and regurgitation back into the stomach of gastric, pancreatic, and other juices likewise occurs, and these form the mixed secretions found in the fasting stomach to the amounts of 30 c.cm. or 50 c.cm. This is the condition of the pylorus in the fasting stomach, and at the height of the acid curve during digestion it begins to return to this state as the stomach empties. In the condition of irritability the pylorus refuses to commence this independent relaxation at the usual time, and the acid curve continues to mount as the concentration of HCl in the gastric contents increases. In a certain number of patients the stomach empties very rapidly and the food is shot through the duodenum without being held up. Regurgitation cannot take place in such cases, and a climbing curve results.

Although we cannot usually show in any one individual all the phases in the action of the pylorus from the onset to the cure of his complaint, sometimes however, we are fortunate enough to meet with such cases, and there can be no doubt whatever that pyloric hypertension occurs to different degrees, for different times, and irregularly in the same patient, so that one must not expect every case to give a typical curve of defective neutralisation. In the case of a patient, who worked out many curves upon himself and who suffered from pyloric pain, the normal curve was that which he most constantly showed when in an interval of freedom, and a curve of deficient neutralisation when in a period of illness. He used an electrical method and therefore only extracted small quantities each time. Although there was no pain during the examinations one would have expected, with a rising acid curve, some slight prolongation of the emptying time as seen in Figs. 10 and 11. This is probably due to the difficulty of accurately determining the emptying time when a full mixed meal is used, unless the stomach is washed out (Figs. 16 and 17).

In a series of 138 cases of fractional test-meals 101 showed pain in isolated positions and 37 in combined positions. There are three groups of curves: (1) normal; (2) deficient neutralisation (=pyloric hypertension; (3) excessive neutralisation (=pyloric hypotension). The analysis of the 101 cases is as given in Table III.

TABLE III.

Position of pain.	Curves.			Total.
	Normal.	Defective Neutralisation.	Excessive Neutralisation.	
Upper sternum ..	—	1	—	1
Lower sternum ..	3	—	—	3
Upper st.-umbilical	27	19	5	51
Middle "	5	9	—	14
Lower "	2	20	—	22
Right 9 c.c. ..	3	2	—	5
Left 9 c.c.	1	1	—	2
Right and left 9 c.c.	—	3	—	3
	41	55	5	101

Combining the areas together we obtain the following:—

Part affected.	Pylorus.			Total.
	Normal.	Hypertension.	Hypotension.	
Cardiac region ..	27	19	5	51
Pyloric region ..	11	35	—	46
Œsophagus ..	3	1	—	4
	41	55	5	101

In this series pyloric hypertension occurred in 37·2 per cent. of cases with cardiac pain, in 76·1 per cent. of cases with pyloric pain, and in 25 per cent. of cases with œsophageal pain. This series of cases, therefore, strongly supports the view that the hypothesis formed above of the probable course of pathological events giving rise to the pyloric syndrome is correct; and also that both cardiac and œsophageal pain are often secondary to the pyloric hypertension occurring in this condition, because the percentage 37·2 is higher than should occur in a normal series. The number of œsophageal cases are too few to be reliable, but curves are not as a rule done in such cases. The cases of hypotonic pylorus belong to the cardiac group of cases.

Turning our attention now to the amount of gastric juice secreted. Of 54 cases of diminished secretion 32 affected single areas and 22 combined areas. An analysis of the 32 cases is as shown in Table IV.

TABLE IV.

Position of pain.	Time of onset.				Cases.
	At once or quite soon.	½–1 hr.	1 hr. up.	Irreg.	
Upper sternum ..	—	—	—	1	= 1
Lower sternum ..	—	1	3	—	= 4
Upper st.-umbilical	3	8	3	2	= 16
Middle "	2	2	1	4	= 9
Lower "	1	—	1	—	= 2
Total	6	11	8	7	= 32

It appears that in diminished secretion of gastric juice the body of the stomach is more likely to be affected than the pyloric end. With regard to the time of onset of symptoms, in only a quarter of the cases did the pain begin later than one hour after eating. If all cases are combined together in respect of this point the following result is obtained :—

—	Time of onset.				Cases.
	At once.	½–1 hr.	1 hr. up.	Irreg.	
All areas and combinations ..	13	16	14	11	= 54

So that not only is the body of the stomach more often affected when the secretion is diminished, but the symptoms tend to occur irregularly and in the early period of the digestive process. There is no primary form of functional disturbance of the stomach due to a diminution of gastric juice ; so long as the stomach empties normally there are no ill-effects or secondary symptoms, but if delay occurs bacterial fermentation of carbohydrates may occur if the free HCl falls below 0·07 per cent. Any marked degree of dilatation of the stomach or bacterial fermentation is, so far as I am aware, unknown in functional disturbance of the stomach.

It is doubtful if hypersecretion of the gastric juice is ever a primary cause of functional disturbance of the stomach. A digestive hypersecretion in which amounts above the average normal are secreted during digestion and which may outlast this act for varying times is common enough, especially in duodenal and pyloric ulcers, and is recognised by a rapid rise in the total chloride curve when the stomach is full and emptying normally, or sometimes by the continuance of the secretion when the stomach is empty ; it is, however, uncommon to find large amounts of juices in the fasting stomach, most amounts being well within the average limit of 30 c.cm. Clinically such cases differ in one respect only from those in which no such increase occurs, and that is in the eructation of fluid in larger quantities than usual. The question arises whether the so-called periodic hypersecretion—that is to say, paroxysmal attacks of hypersecretion of gastric juice—ever gives rise to symptoms which entitle it to be styled an independent affection. It is quite true that there are cases in which attacks of pain and the vomiting of large quantities of watery fluid of varying degrees of acidity occur, and that in such cases no signs of any nervous disease are present or of any cause which might produce a reflex effect upon the stomach. It is, however, impossible to speak of such cases as gastric neuroses unless they have been shown free from organic disease by operation, a state of affairs I have not yet personally seen. My view would be that it is not yet proved that any alteration in the secretion of gastric juice could be described as constituting a primary functional disturbance of the stomach, although, when present, both a diminution and an increase in the gastric juice undoubtedly modify the gastric symptoms present in the different forms of dyspepsia in which they occur.

B. CARDIAC SYNDROME.

The body of the stomach shows the important difference from the pyloric end that the symptoms due to its disorder are manifested during both phases of activity of the stomach. They are due to incapacity on the part of the body to accommodate itself to the volume of its contents whilst it is being filled or emptied. In the former case the lengthening reaction and in the latter case the shortening reaction of its muscular fibres is interfered with, and their contraction tension is raised.

Causes.

1. In order that the stomach may accommodate itself in the normal fashion *whilst it is being filled* with food, two conditions must be fulfilled. The food must not be eaten too quickly and the muscular coat must be able to respond in the normal manner.

(*a*) The first cause of the cardiac syndrome, therefore, is bolting of the food. Now a great many people bolt their food with impunity, or occasional feelings of fullness only, but sooner or later, depending upon the make up of the nervous system of the individual, the muscle becomes irritable, reacts too strongly, and an attack of dyspepsia supervenes.

(*b*) The second cause is either irritability of the neuro-muscular mechanism or the so-called atony.

Irritability is brought about in one of the three ways I have already mentioned in the case of the pyloric region. (1) A local focus of irritation to the myenteric plexus as an ulcer of the body of the stomach, or a general irritability produced by acute gastritis. (2) Reflex irritation from some other portion of the digestive tract, and about this we know less than in the case of the pylorus, except that it no doubt occurs. (3) Instability of the central nervous system, on the other hand, is of the greatest importance as a cause of irritability of the body of the stomach. This effect is no doubt exercised through the vagus. There is in all cases some slight cause, probably sometimes no more than a mere exaggeration of the normal movements or sensation. The condition becomes exaggerated and persists as a chronic irritability.

Atony of the stomach in the old sense as a primary condition probably does not exist, but there can be little doubt that in conditions of debility the stomach may be hypotonic as a part of this condition. It is difficult to prove this statement because it is never of any marked degree. As a secondary effect it does not lead to much dilatation of the stomach. The X rays have shown that all cases of marked dilatation are obstructive. Inhibition of the stomach, as Cannon has shown experimentally, may be produced both reflexly and by emotional disturbance. Such conditions in clinical medicine are undoubted and perhaps more as temporary than chronic effects.

2. *As the stomach empties* this condition of neuro-muscular irritability again interferes with the function of accommodation sooner or later during digestion, the exciting cause being the condition of the gastric contents.

In addition to these primary causes the body of the stomach becomes irritable as I have described, or atony may supervene secondary to pyloric irritability.

EFFECTS PRODUCED.

1. *Filling of the Stomach.*

When the normal stomach is *filled too rapidly* with food the muscular fibres are unable to undergo the normal lengthening reaction, and react too strongly, with the result that the intragastric pressure rises, the contraction tension is raised, and a sense of fullness results. After a time as the stomach empties accommodation occurs and the symptom disappears.

When the condition of *irritability* has supervened in any of the ways already indicated and the irritability is excessive the accommodative power of the

stomach is also interfered with. Although the stomach is filled normally the reflex tonic reaction is at once excited and a feeling of fullness or pain is experienced within a few minutes of eating the meal. During the actual consumption of the food there is, as a rule, no pain, and if pain is present it is often temporarily relieved. The explanation is that as the food enters the stomach the relaxation of the cardiac sphincter is accompanied by a receptive relaxation of the body of the stomach through the vagus.[30] It is only temporary and when the meal is finished excessive contraction of the stomach occurs. Such patients may feel quite full after eating small amounts and so they reduce the quantity of their food accordingly. This does not produce the desired result, because owing to the absence of the normal stimulus to the lengthening reaction, the stomach contracts all the more and similar to what occurs on experimental section of the sympathetic. The result is wasting due to insufficient food. Even though the stomach empties rapidly pain may be constantly present and occur in the empty stomach; this must be regarded as due to excessive hunger contractions, the central nervous system being hyperæsthetic. It is more particularly in these nervous conditions that emotion is likely to bring on irregular attacks of pain.

By *atony* is probably meant some degree of loss of tone in the muscle-fibre associated with irritability—in other words, a condition of irritable weakness. Accommodation is defective because the muscular fibre is already relaxed, and when food is put into the stomach a certain amount of tonic reaction occurs at once as the threshold for this reaction is lowered, and the feeling of fullness results. Pain is never present, because the muscle is unable to recover its tone sufficiently to increase materially the contraction tension.

2. *Emptying of the Stomach.*

The function of the body whilst the stomach is emptying is to maintain a constant pressure upon the food, which keeps the pyloric vestibule full. So that it not only acts as a reservoir, but is also the filler-up of the pyloric region. The pressure in the body of the stomach is maintained at a constant level, by the capacity the muscle-fibres have of undergoing a shortening reaction without any increase of their contraction tension. The empty stomach is contracted up and contains a certain amount of air and mixed secretions. Boldyreff [31] first showed that rhythmical contractions occur periodically in the empty stomach, which Cannon and Washburn [32] demonstrated as being the cause of hunger sensations. Carlson [8] has further analysed these movements in detail and shown that two distinct types of movement occur. The first is a tonus rhythm affecting all parts of the body in which the tone increases and diminishes, this alternation continuing constantly without cessation. The second is peristalsis which begins near the cardia and traverses the whole body and pyloric region. When the stomach is filled these two movements cease and the body of the stomach is apparently quiescent, its only action being the steady pressure maintained by its tone. After a short time shallow peristaltic waves appear at the fundus and in about half an hour a tonus rhythm may be demonstrated at the cardiac end. The tonus rhythm and peristaltic waves increase in intensity as digestion proceeds, and continue as those of the empty stomach described above. So that in addition to maintaining its steady grip upon the diminishing contents the body shows rhythmic increase of tone and peristalsis after a period of quiescence.

When the neuro-muscular mechanism is irritable these movements are exaggerated—that is to say, there is a general increase of the tonic contraction, with increase of the tonic variations which no doubt amount to gastrospasm in some cases. The symptoms due to these exaggerated contractions will be likely to commence when the body really gets to work, in about half an hour after eating, but they may appear at any time up to about two hours later since the acidity is rising and the gastric contents becoming increasingly irritating. They will not be likely to begin later since the gastric contents will have materially diminished in volume and the wave of neutralisation commenced, for the pylorus will be acting normally. Variations naturally occur, for in some cases the food leaves the stomach rapidly and now the symptoms will be shorter and less severe. If pain occurs later than about two hours after food it may be concluded that the pylorus is beginning to hold up the contents. The earlier the pain comes on the more likely is it to depend upon irritability due to the central nervous system, and the later it appears the more it depends upon the irritating and acid gastric contents. Alkalis will remove the symptoms in these cases.

Owing to the increased pressure in the body œsophageal regurgitation is liable to occur as in the pyloric syndrome. The fluid may be acid if neutralisation has not yet occurred, but it is more often bitter or neutral since the acidity of the contents is lower than in pyloric cases. The patient is more neurotic and more likely to eructate gas voluntarily. This type of case produces no effect whatever upon the acidity of the gastric contents nor upon the digestive process. When food is eaten the movements are inhibited, a lengthening reaction takes place in the muscular fibres, and the pain ceases. This is not always the case nor does it occur so regularly as in pyloric cases, for relaxation occurs less easily when the muscle is very irritable, but even when pain comes on in half an hour after food it is not uncommonly relieved. When the stomach is hypotonic there is no pain but sometimes fullness, for the muscle is unable to recover its tone sufficiently to increase materially its contraction tension. As the stomach empties owing to the loss of tone the pyloric end is not kept normally filled so that the emptying time is delayed. The symptoms disappear as the contents become less. The tone of the cardia is lessened and eructation and air-swallowing facilitated, which symptom depends upon the state of the nervous system of the patient.

C. Œsophageal Syndrome.

Œsophageal symptoms are due to the presence of liquid or solid material or gas, which give rise to reflex tonus rings and peristalsis. Their presence is accounted for by regurgitation from the stomach or by abnormal deglutition—that is to say, bolting the food and gulping down liquids. We know very little indeed about reflex nervous effects upon the œsophagus, but there can be no doubt that the influence exerted by the central nervous system is very marked.

Regurgitation into the œsophagus tends to occur whenever the intragastric pressure rises as the result of increase in muscular contraction or external pressure as in voluntary eructation, and is only prevented by the tone of the cardiac sphincter, which follows that of the body of the stomach. This tone is normally low, for an intragastric pressure of 25–30 c.cm. of water is enough to overcome it. However the regurgitation is produced the effects upon the œsophagus are the same. Speaking broadly, the effects are modified by the degree of acidity of the gastric contents and the condition of the œsophagus as regards irritability. Cannon [33] has demonstrated experimentally the course of events when a fairly full liquid meal is administered to the cat. So long as the contents are neutral the liquid regurgitates at each relaxation of the cardia three or four times a minute, but when the gastric contents become acid the regurgitation ceases owing to increased tone of the sphincter. Each time regurgitation occurs the fluid is held up by the cardiac sphincter and passed back into the stomach by reflex peristaltic waves originating in a tonus ring produced at the upper end of the fluid. It is common enough to witness the same series of events by the X rays in patients after a full meal and when lying on the back, without their experiencing any sensation whatever. This is the usual result when the nervous system is normal and the œsophagus not irritable, unless the gastric contents are acid in reaction, as, for example, during the later stages of

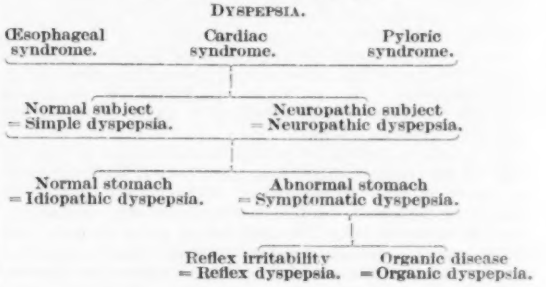
digestion in the condition of pyloric irritability. In such a case repetition of the regurgitation after a time leads to irritability of the muscular coat and mucous membrane of the œsophagus, and the fluid is held up for longer periods by persistent hypertension of the cardiac sphincter. Increased tension is maintained in the œsophagus by persistent ring spasms at various points. Tightness or aching is thus produced in the lower chest, and a burning sensation may be imparted to it by the hypersensitive mucous membrane and twinges of referred pain may occur in the jaw. Severe pain at the ensiform is now and then experienced from spasm of the cardia and lower œsophagus. Swallowing water will relieve the feelings by clearing the œsophagus.

When the patient is neurotic other symptoms are liable to occur whatever is the reaction of the gastric contents. These are due to the hypersensitive condition of the mucous membrane, to the ready and persistent response of the œsophagus to stretching, to the efforts at voluntary eructation, and excessive voluntary swallowing movements. The effects of the latter, although they may on occasion temporarily remove the œsophageal contents are, on the whole, to maintain the condition. In the normal individual the cardiac sphincter does not relax before each peristaltic wave, particularly if saliva and air alone are swallowed, so that in these patients the contents, chiefly air and some liquid, tend to be held up, unless the sphincter relaxes before the swallowing of food or is forced by the voluntary efforts of the patient, a feat he is by no means always able to perform. The air is retained in the œsophagus by a ring spasm at the upper part and a constant lump or tightness is felt in the upper sternum, which the patient often tries to swallow. The air moves up and down the œsophagus in response to ineffective reflex peristalsis, and such patients may feel the sensations shift up and down. Sometimes exaggerated peristalsis occurs with every meal and the patient feels his food pass all the way down like a series of lumps; or the hyperæsthetic mucous membrane causes a burning or soreness throughout the whole length of the œsophagus.

Abnormal deglutition as a primary cause of œsophageal symptoms is due to imperfect mastication and lubrication of the food and rapid swallowing. The food passes down the œsophagus slower than normal, as first shown by Hurst [34] with the X rays, and according to him it may take 15 minutes to descend in place of the normal 8 to 18 seconds. Several pieces may be seen in the œsophagus at the same time; occasionally it may stick for a long time at the level of the bifurcation of the trachea and even be regurgitated. The cardia may hold up the food, and in one of my patients a piece of meat was fished up from the lower end of the œsophagus. I am quoting cases who after some years are now in perfect health.

Œsophageal peristalsis is a reflex act which is initiated by a single afferent impulse started by the contact of the food with the back wall of the pharynx and adjacent areas. This single impulse is sufficient to ensure the completion of the act of swallowing. It spreads in the deglutition centre evoking a series of motor discharges which pass through the vagi to the œsophagus. What is particularly important from our point of view, however, is that œsophageal peristalsis may be initiated at any point in its course by local stimulation. A foreign body in the œsophagus as shown by Carlson,[8] if it causes a certain degree of distension, will produce a local contraction lasting up to a few minutes at the point where it is lodged; from this local ring spasm peristaltic waves are sent down the œsophagus periodically till the body is removed. A voluntary deglutition will start off these movements again when they have quieted down. This form of tonic contraction is due to a reflex through the vagus. Cannon [35] has shown experimentally that the lower portion of the œsophagus, the muscular coat of which entirely consists of unstriped muscle, is able to take on an automatic action, when the vagi are cut. When the wall is stretched by food a ring constriction appears and from this peristaltic waves pass down and clear the œsophagus; these movements occur as the result of local reflexes through Auerbach's plexus. This temporary retention of food and gas in the œsophagus through the ring spasms produced causes tightness and pain in the chest soon after meals. The normal peristalsis of the œsophagus when a meal is eaten properly clears away the material and relieves the symptoms. In the patient of stable nervous system such symptoms are of little moment and only occur when the individual in question is indiscreet. If the bolting of food becomes a customary proceeding or the patient is neurotic, the œsophagus becomes irritable and hypersensitive and more easily responds to stimulation. Voluntary eructations and swallowing movements add to the air in the œsophagus, and all the other phenomena develop which I have already described.

Classification of Dyspepsia.



The symptoms included under the term dyspepsia are due to altered nerve reflexes and vary in accordance with the excitability of these reflexes, which in turn depends upon the stability of the central nervous system. Individuals vary very considerably in this respect and many grades exist between the average normal person and the neuropath, so that the symptoms constituting dyspepsia must be classified according to the stability of the nervous system of the subject of them.

1. Normal Subject.

The nervous system of this type of individual is normal, and the normal stimulus of food gives rise to a normal motor response, with little or no sensory accompaniment.

The functional disturbance of the stomach from which such a person suffers is of the *physiological order*—that is to say, an abnormal stimulus gives rise to an increased motor response with sensory accompaniment. Such a condition may be called *simple dyspepsia*, and this includes three fundamental groups of symptoms:—

1. *Pyloric syndrome* in which the symptoms are due to irritation of the pylorus, with secondary effects upon the body of the stomach and the œsophagus.

2. *Cardiac syndrome* in which the symptoms are due to irritation of the body of the stomach with secondary œsophageal effects.

3. *Œsophageal syndrome* in which the symptoms are due to primary or secondary irritation of the œsophagus.

The symptoms are characterised by order and regularity in their appearance and disappearance and are clearly indicative of the region affected. They occur at stated times during digestion when the irritable part is brought into action, and cease when its task is ended. They are easily relieved by removing the abnormal stimulus—that is to say, by dieting the patient. The pyloric syndrome is particularly characteristic of this type.

2. Neuropathic Subject.

The functional disturbance of this type of person is of the *pathological order*—that is to say, a *neurosis*. There are two groups of cases.

1. The increased motor and sensory response may persist after cessation of the abnormal stimulus. This condition is

an advanced stage of that described as simple dyspepsia. All patients do not proceed to it, but only those who are of a neuropathic tendency or have acquired it by exhaustion, overstrain, overwork, and worry, and especially those suffering from the cardiac and œsophageal syndromes. The pain appears sooner than it did before or irregularly, and is influenced by emotion, nerve strain, and other occurrences of everyday life, but is not so easily relieved by food. Attacks are easily precipitated and are not so easily relieved by treatment as formerly. Voluntary interference on the part of the patient also tends to obscure the syndrome.

2. In the second group the patient is definitely neuropathic, but there is always some initial disorder, however trivial, which may soon be overshadowed, since there is lowering of the threshold of excitability leading to constantly increased motor and sensory disturbance, the stimuli being normal. The cardiac and œsophageal syndromes are those most constantly present, but all the parts may be affected in equal degree simultaneously or irregularly. Disorder and irregularity are characteristic of this type, and symptoms may be present in the empty stomach. In some cases the patient begins to interpret his symptoms variously and acquire exaggerated motor and sensory symptoms depending on his ideas of what they should be. The symptoms thus lose their localising value. Isolated symptoms are developed such as eructatio nervosa, anorexia nervosa, or perversions of appetite, nervous vomiting, nervous nausea, painful emptiness, transient obstruction of the œsophagus; in fact, any symptom may become an obsession or a phobia.

These syndromes occur in three different types of stomach.

(*a*) The stomach may be *normal*, and in this case the causes of these disturbances are twofold:—

1. The quality or quantity of the food or drink; its mode of preparation; or the presence of irritants in it.

2. The mode of filling the stomach, in which both mastication and deglutition are concerned.

The disorders are more easily excited in the stomach in individuals who are the subjects of some chronic illness, such as anæmia or an infective process or intoxication.

(*b*) The stomach may be the seat of *organic disease*.

1. The disease—for example, ulcer—acts as a focus of irritation to the part of the stomach in which it is situated and the same syndromes as in simple dyspepsia are produced by the food. The patient commonly has no symptoms when living a regular life and on a plain diet, but if either of these conditions is unfulfilled the position of the disease determines the resulting syndrome. The syndromes are characterised by great regularity in the pain and its recurrences, and by its severity and long continuance. If the patient is neurotic the regular symptoms are overshadowed and the condition becomes unrecognisable.

2. If the stomach is structurally altered, so that the motor functions are interfered with as in pyloric obstruction or cancer, the disordered functions are so pronounced as to constitute special indications of the disease in question. The X rays and other tests afford valuable aids or conclusive proof of the existence of organic disease.

(*c*) The stomach may be the subject of *reflex irritability* from some other part of the body, more particularly of the alimentary canal, the chief causes being the gall-bladder, the intestines, and the appendix. The symptoms are produced by the food and the resulting syndrome depends upon the part of the stomach irritated and the time when the irritation is most marked.

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(*Continued at foot of next column.*)

THE EARLY DIAGNOSIS OF CANCER OF THE COLON AND RECTUM.*

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THE early diagnosis of carcinoma of the colon depends primarily upon the ability of the practitioner to obtain an accurate history of the patient and to recognise what symptoms should lead him to suspect that this disease is present. By the time that the first symptoms appear a growth is likely to have attained such a size that a definite diagnosis can be made by means of the X rays, the sigmoidoscope, and examination of the stools, or, in the case of the rectum, by digital medical examination.

The table gives the duration of symptoms at the time of admission into New Lodge Clinic for diagnostic purposes of 25 consecutive cases of cancer of the colon and rectum.

Table showing Duration of Symptoms in Twenty-five Cases sent for Diagnosis.

Cases.	Duration of symptoms in months.	Cases.	Duration of symptoms in months.
2	2	5	12
3	3	2	16
1	4	3	18
2	5	1	24
4	6	1	36
1	8		

The case in which symptoms had been present for three years was one in which malignant degeneration had occurred in a group of polypi in the descending colon. As an early diagnosis and operation might have prevented the development of carcinoma, there is no reason why it should not appear in the table.

* An abstract of this paper was communicated to the Proctological Section of the Royal Society of Medicine on May 3rd.

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The average duration is 10½ months, or 9½ months if the case of polyposis is excluded. It is clear, therefore, that the prospects of radical cure by operation would have been very different if all the patients had been sent for investigation directly they complained of suspicious symptoms.

The two earliest symptoms are abdominal discomfort or pain and a change in the habitual action of the bowels. Both symptoms were present in almost all our cases. The discomfort or pain is localised in the segment of bowel proximal to the obstruction. It is a small intestine pain and is felt in the neighbourhood of the umbilicus in cancer of the cæcum. In cancer of the ascending colon or hepatic flexure it is felt on the right side of the abdomen, and in cancer of the splenic flexure, descending, and iliac colon, and the proximal part of the pelvic colon, it is felt on the left side. Pain produced in the middle segment of the transverse colon is felt just below the umbilicus, and that caused by growths in the distal part of the pelvic colon or pelvi-rectal flexure are localised in the middle line between the umbilicus and pubes. The pain is often colicky, and its disappearance may coincide with a gurgle which can be heard and felt; this is a most significant symptom, which may enable the patient to localise the site of obstruction with great accuracy.

In 9 out of 25 cases the patient had become more constipated and in 6 he had complained of diarrhœa; in 8 cases there was alternately constipation and diarrhœa, or an initial attack of diarrhœa followed by persistent constipation. It is necessary to add that in cancer of the rectum and pelvic colon the diarrhœa is of a spurious type, examination of the stools showing that solid fragments are mixed with the semi-liquid fæces. In only two cases had no change in the habitual action of the bowels been observed.

In contrast with carcinoma of the stomach general symptoms are rarely observed in the early stages. The patient may feel quite fit, with a good appetite and undiminished energy. No anæmia is present and no weight is lost. In only one of this series of cases and in one other earlier case were general symptoms present without intestinal symptoms. The patients were anæmic and complained of anorexia and loss of energy. As occult blood was found in their stools and complete achlorhydria was present, carcinoma of the stomach was diagnosed, though the X rays had shown no abnormality. A growth of the ascending colon was, however, found in one case and a growth of the splenic flexure in the other.

Radiological Diagnosis.

An opaque enema is of great value in demonstrating the site of any obstruction in the colon, as one of us first showed just 20 years ago. It is a curious fact that the enema may be temporarily or permanently held up by an obstruction, which leads to no obvious delay in the passage of an opaque meal. The actual passage of the fluid should always be watched, as a slight obstruction may lead to only a temporary delay in the passage of the fluid, caused possibly by spasm. The point where any delay is observed should be palpated under the screen, as it is not uncommon for a small tumour to become palpable when one's fingers are directed to its exact localisation. Before accepting the apparent "hold-up" of an enema as evidence of a stricture, the patient should turn on to his face, as the fluid occasionally passes on in a normal manner when this is done.

A good radiogram may show the nature of the obstruction, as the narrowing caused by adhesions, diverticulitis, and a fibrous stricture following ulcerative colitis all give appearances which are to some extent characteristic and differ from the irregular jagged outline of that produced by a growth. A filling defect is sometimes recognisable in the complete absence of any obstruction.

It is very important to remember that early cases of carcinoma of the colon may show no filling defect and cause no obstruction to the passage of an opaque meal or opaque enema. In 1909 and again in 1915, before we fully realised this, one of us rejected the diagnosis in two cases, in which the symptoms had made him suspect a growth of the colon. Within three months a tumour became palpable in both cases; the delay in advising operation may have been the cause of the subsequent recurrence.

As a definite diagnosis had been made by rectal and sigmoidoscope examination in 5 out of the series of 25 cases, an opaque enema was given in only 20. It showed obstruction in 14 of them and a filling defect without obstruction in the others; in four of the former an opaque meal also showed obstruction. In one case the meal showed obstruction four inches above the level of the iliac crest, where the opaque enema had been obstructed; corresponding with this the growth was found to have formed the head of an intussusception four inches long. In one case an opaque meal revealed an obstruction which was not shown by an enema, and in one case neither enema nor meal showed any abnormality.

The Stools.

The presence of mucus with a solid stool is of no clinical significance, but blood or pus, with or without mucus, is always an indication that further investigations are required. If associated with entirely fluid or semi-fluid stools, ulcerative colitis is in all probability present, but if in addition fragments of solid fæces are found, even if the patient complains of "diarrhœa," a growth of the pelvic colon or rectum is a more likely diagnosis, but visible blood and pus are hardly ever observed when the growth is proximal to the pelvic colon.

When no abnormal constituents are recognised with the naked eye the patient should be given a farinaceous and chlorophyll-free diet and some charcoal. As soon as all the charcoal has been passed the stools should be examined chemically and spectroscopically for occult blood. In our experience this is present in all or almost all specimens in every case of cancer of the stomach and of the colon. Obvious blood was present in the stools in four cases involving the rectum and in one out of eight involving the pelvi-rectal flexure, but in only one other—the growth of the iliac colon which had formed a chronic intussusception. Occult blood was found in all the remaining 19 cases. In each case a positive guaiac reaction was obtained; in four this finding was confirmed by an extract giving a spectrum of hæmatoporphyrin alone, in three of acid hæmatin alone, and in two of both hæmatoporphyrin and acid hæmatin. The acid hæmatin spectrum is of special importance, as it is rarely seen in cancer of the stomach or ulcer of the stomach or duodenum except after a large hæmorrhage, and it is then always accompanied by the spectrum of hæmatoporphyrin. Of the 19 stools containing no obvious blood four had some excess of mucus, and in two of these and one additional case the patient had occasionally noticed traces of blood before admission to the clinic.

Occult blood is rarely found in uncomplicated diverticulitis and never in constipation or diarrhœa unaccompanied by organic disease. Curiously enough a local band of adhesions involving the colon may also lead to the constant presence of occult blood in the stools. As this condition sometimes gives rise to symptoms and radiological signs indistinguishable from those caused by a growth, the differential diagnosis may be impossible, though there is generally a longer history or illness, the details of which often point to the probable cause of the adhesions. Fortunately it does not greatly matter if a mistake in diagnosis is made, because this type of adhesion is the one form which can generally be dealt with satisfactorily by operation.

Sigmoidoscopy.

It is unnecessary to say anything before the Proctological Section about the value of the sigmoidoscope in the early diagnosis of carcinoma of the pelvi-rectal flexure and pelvic colon, but we should like to suggest, as we have often done before, that it is time that the

profession as a whole learnt to use this instrument, which should no longer be regarded as one which should only be handled by the proctologist. Nobody thinks of diagnosing pharyngitis without direct inspection of the pharynx; nobody should think of diagnosing hæmorrhoids or colitis without digital examination of the rectum and direct inspection of the colon. If this rule were always followed the lives of many patients, who now reach the surgeon too late for radical operation, would be saved. The President of the Section doubtless remembers performing a colostomy on a patient in whose rectum we had found a large inoperable growth; he had seen no less than five medical men within three months of consulting us, not one of whom had made a rectal examination. We have also seen a number of patients with growths of the rectum or pelvic colon, who had just undergone a course of Plombières douches at a British or Continental spa, in whom a digital or sigmoidoscopic examination would have at once revealed the nature of their disease. For successful sigmoidoscopy neither an anæsthetic nor a previous injection of morphia is ever required, and the patient should, if possible, be examined without any preparation by aperients or enemata.

In the present series of 25 consecutive cases a tumour was palpable on abdominal examination in six, in one of which it was only discovered whilst palpating a visualised filling defect under the screen during an X ray examination. In all four cases of rectal carcinoma the tumour could be felt on ordinary digital examination, and in one case involving the pelvic colon it was felt through the anterior rectal wall. The pelvi-rectal flexure, which is the commonest of all sites of carcinoma of the bowel, is situated 4½ inches from the anus and has only a very small range of movement. A growth in this situation is therefore beyond the reach of a finger inserted *per anum* and is only rarely palpable on abdominal examination, but it can easily be recognised with the sigmoidoscope, as it was in the eight cases in our series. In seven cases the tumour was beyond the reach of the sigmoidoscope and was also so small or, in the case of the splenic flexure, situated so high up under the left costal margin that it could not be felt on abdominal examination.

If all cases of suspected carcinoma of the colon were sent for diagnosis within a month of the onset of symptoms many patients would be advised to undergo an operation when the evidence was still inconclusive. But an occasional unnecessary exploration will be more than compensated for by the infinitely better prospects of permanent cure, which will be present if the average duration of symptoms is one instead of ten months when the patient is sent to the surgeon. The surgeon also should be prepared to act upon the indications given by the physician. In 1922 a man of 52 was sent to us with a short history of constipation and attacks of colicky pain in the region of the splenic flexure. Nothing abnormal was felt on abdominal examination and an opaque enema revealed no filling defect nor obstruction, but an opaque meal was held up at the splenic flexure for 48 hours. The stools constantly contained occult blood. A diagnosis of early carcinoma of the splenic flexure was made and the patient was advised to undergo operation. Being dissatisfied, he consulted a well-known London surgeon, who removed his appendix. As no improvement followed the same surgeon six months later divided adhesions which had formed in connexion with the first operation. In 1925, just over three years after we had diagnosed a growth of the splenic flexure, acute obstructive symptoms developed, and the surgeon, who had ignored our advice, now found an inoperable growth of the colon in the exact position we had originally indicated.

We have said enough to show that the early diagnosis and successful treatment of cancer of the colon depend upon timely coöperation between the general practitioner, the diagnostic team, and the surgeon.

OF HALLUCINATIONS.

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THE Note on Night-terrors, by Dr. J. W. Shackle, in THE LANCET of Feb. 11th, is of great interest to students of psychological medicine, for this disorder is an example of the interaction of psychological and physiological processes. Physicians know well that a physical illness is always associated with a certain degree of mental change, whether it be only a slightly biased outlook on life, generally during the illness, or a more severe and prolonged alteration. There is also a growing amount of evidence that diseases which seem to originate in the mind, such as anxiety states, compulsion neuroses, and possibly psychoses, if not checked, end in physical changes which may go on to organic disease. When the signs and symptoms of an illness suggest that one or more of the body organs is out of order the line of treatment may be clearly indicated. The same may be said of psychical illnesses, but there is a small group of diseases which it is difficult to class, for their signs and symptoms reveal both psychical and physical disturbances, which may have the same origin. This group contains night-terrors, epilepsy, migraine and perhaps psychoses. Primary psychical illnesses such as the neuroses may have had their beginnings, as Alfred Adler suggests, in inherited organic weaknesses and subsequent psychic over-compensation, resulting in excessive emotional strain, and so giving rise to unduly accentuated anxiety, sorrow, grief, disappointment, or alarm. Unlike the neuroses this group seems to have its origins in neuronic instability, although the manifestations might equally indicate a psychical cause. Indeed, some psychologists apparently believe that even epilepsy, which shows so many physical signs and symptoms, is a psychical disease. They base their suppositions on observations of the attacks or fits, which, they declare, are expressions of extreme fear or anger giving rise to such violent attempts at flight or fight, with mental disorganisation and physical incoördination, that the patient is at once rendered unconscious and totally incapable of acting in a purposive manner. We are at liberty to accept this explanation provisionally, for many epileptics show no physical cause for their attacks. We must then turn our attention to the question of what constitutes mind, for the instinct to escape from or to fight a threatening danger, and the emotions of fear and anger which accompany its working, are mental activities.

The Evolution of Mind.

The "Mind" is that which minds the individual—i.e., takes heed or care of it. Mind is not a mysterious deity or spirit enthroned in the body, but the function of groups of specialised cells whose duty it is to govern and coördinate all the groups of cells comprising the body. A simple unicellular being, such as the amœba, has innate tendencies which cause it to behave, inevitably, in certain ways. It must be nourished, it must divide, and it must exert some resistance against environmental activities. Accepting the theory of the evolutional origin of multicellular beings, we can understand that in their simpler forms every cell possesses these tendencies, but that in more complex forms it is necessary for groups of cells to undertake certain functions in order to fulfil these essential needs. Some groups specialise in nutrition, others in reproduction, and others in defence. That all these groups may work together for the common good, it is necessary for them to be coördinated and directed, and this is the function of the nervous system. A coördinating and directing system must know something of the groups it has to govern, or "mind." Its duty is not to digest, to fight or to reproduce, but to mind these processes, and so we may assume that the functions or enduring processes

of the cells which do this work constitute the foundation of mind. The mind, therefore, is founded on the instincts of nutrition, self-protection and reproduction, which give rise in special situations to qualities of experience called emotions. Each instinct has its own peculiar emotion (which some believe sets it in motion and others believe results from its motion). The instinct of nutrition is associated with the experience of hunger, the instinct of self-protection with that of fear or anger, and the instinct of reproduction with love or lust. Instinct and emotion always work together in this way. Love never gives rise to anger and fight, hunger for food never arouses the reproductive instinct, and anger never activates the nutritional instinct.

In the higher animals the cells which perform these fundamental instinctive functions are believed to be in the basal ganglia of the brain. Therefore, just as there are areas of the brain which possess innate power to transform neuronic changes of special kinds into experiences of sensation—i.e., seeing, hearing, tasting, smelling, and touching, and experiences of physical movement, so there are areas in the basal ganglia which correlate all these changes into the experiences which we call emotions or feelings.

Effect of Neuronic Instability.

It is well understood that any neuronic instability results in disordered function. Neuronic instability anywhere in the visual system will give rise to defective sight or visual hallucinations. Neuronic instability in the auditory system will occasion defective hearing, manifested either in various degrees of deafness or in auditory hallucinations. The same is true of the tactile and other sensory systems, in which defective function or hallucination is by no means uncommon, and of the efferent nervous systems, whether secretory or motor. Instability of the secretory neurones will cause hypo- or hypersecretion, while instability of motor neurones may result in paresis, paralysis or twitchings, or clonic or tonic spasms of the muscles they innervate. It would not, therefore, be surprising to discover that instability of some of the neurones of the basal ganglia gave rise to emotional hallucinations.

Some writers on epilepsy have attributed the attacks to abnormal activity in the cortex of the cerebrum. When the cortex is known or found post mortem to be diseased or otherwise injured, the inference is reasonable, but it does not account for the fits. Disease and injury are by no means always followed by such severe disturbances, and in many epileptics no cause whatsoever is found for the fits. While the fits do not differ to any great extent, the auras and hallucinations do. Some patients experience gastric or other "sensations," some visual hallucinations, others auditory, tactile, or olfactory impressions, and a few have described "presences," desire to run, or a feeling of happiness. This would suggest, if we believe that the origin of the attacks is in the cortex: (1) that it is the cortex which enables all these varied activities to be experienced; and (2) that areas of the brain as widely separated as the cuneate and uncinate lobes are subject to the same form of malfunction. This may be so, but it would be more convincing to trace the tracts of those lobes to a point or area where they converge, and whence a disturbance might spread to any one of these areas and downward in such a way as to be widely effective. The basal ganglia of the diencephalon would satisfy this description. If they are the site of the lesion the premonitory experiences of the patients would depend on the proximity of specialised sensory neurones to the site of the disturbance, which of course would be constant though different in each individual. The spread of the disturbance, once it has begun, is rapid. Rushing upwards, it disorganises the higher functions of the brain and causes disassociation, which renders awareness of self and environment impossible; rushing downward over a wide area it gives rise to disorganised or incoördinated violent muscular activity. Head and Holmes have placed in the thalamus the origin not only of primitive emotional experiences but also of primitive sensory experiences. This is consonant with the facts in the majority of hallucinations of epileptics, and of all sufferers from night-terrors and migraine. Their hallucinations are primitive, and often lack the perceptional qualities of true senses, or of hallucinations of senses which might be supposed to originate in perceptual areas of the cortex.

On this assumption we can understand the psychologist's belief that an epileptic fit is an expression of horror, terror, or fury, but we cannot consider it to be a primary psychical disturbance, for we can indicate its area of origin and show it to be an hallucination of an emotion which is due to neuronic instability, probably in the thalamus and certainly in the basal ganglia. Dr. Shackle, in his note on night-terrors, said: "The sensation experienced can be but inadequately described as fear of the most paralysing and dreadful kind, no fear experienced in nightmares or real life having any relation to it whatsoever." Similar experiences have been related to the present writer in the same emphatic terms, and since some of the patients, though still the victims of these awful visitations, are no longer children, they are good witnesses. Like Dr. Shackle, they distinguish between the visual and intense emotional disturbances of nightmares and the pseudo-visions and emotional hallucinations of the night-terror. That the latter is due to neuronic disturbance in the areas of primitive sensation and emotion is probable.

The Cause of Neuronic Instability.

The basal ganglia have to govern the physical needs of the body—nutrition, self-protection, and reproduction. Government is performed largely through the autonomic nervous system and the endocrine system. The nutritional system is developed from the endoderm, the self-protective from the ectoderm, and the reproductive from the mesoderm, and from these tissues are developed the endocrine glands which work in conjunction with the autonomic nervous systems which govern them. Thus from the endodermal tissue, the anterior lobe of the hypophysis, the thyroids, parathyroids, thymus, and pancreas are budded off. Out of the ectoderm, which is devoted to self-protection, are developed the posterior lobe of the hypophysis, the chromaffin bodies, and the medulla of the suprarenal organs. The mesoderm is responsible for the gonads, which are developed with the cortex of the suprarenal organs—probably as a reproductive adjuvant—and the mesoderm system uses the endocrine organs of the other systems because its duty is to form the offspring which requires a moiety of them all. That the basal ganglia depend upon the secretions of the glands they govern for their anabolism—nutritive system—and for their katabolism—self-protective system—is probable. If this be so, then any neuronic instability in the basal ganglia may have its origin in one or other of these systems, and it is there we should look for the cause of night-terrors, epilepsy and migraine, if not of the psychoses also. These are, primarily, physical diseases, though argument might be used to show that abnormal and prolonged strain was the beginning of endocrine mal-function. To such an argument may be countered Adler's suggestion that the endocrine organs involved inherited a weakness, which, for the efficient fulfilment of their function, necessitated an over-compensation of the mind, which was thus exposed to undue impression and influence from environmental factors.

HOSPITAL COÖRDINATION IN NORTH STAFFORDSHIRE.—There are four important institutions in North Staffordshire serving a very large population—the Royal Infirmary, the Haywood Hospital, the Longton Cottage Hospital, and the Cripples' Aid Society. A committee of representatives of the four is considering the feasibility of a scheme of coördination, to be helped by a comprehensive contributory scheme. It is pointed out that, although the North Staffordshire Infirmary has recently added 42 beds, the provision of beds for the district is at present rather less than 1 per 1000, whereas it ought to be 3 per 1000.

Clinical and Laboratory Notes.

A CASE OF INTRACRANIAL HÆMORRHAGE FROM ARTERIAL MALFORMATION

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A FULL report on this type of hæmorrhage, under the name of Spontaneous Subarachnoid Hæmorrhage, has been given by Symonds,[1] who points out that the term "spontaneous" does not imply an absence of ascertainable cause but that it covers all cases of non-traumatic origin. As the presence of the blood in the subarachnoid space under these circumstances indicates either a primary hæmorrhage of the subarachnoid vessels or one that has found its way through cerebral tissue, we might, perhaps, allude to the condition as "intracranial." Further, in view of the description of the cause by Turnbull[2] as "an inherent weakness due to a congenital abnormality in the structure of the arteries at their points of junction," it might be advisable to omit qualifying it as "spontaneous," and one can definitely exclude in the pathology such conditions as neoplasm, inflammation, infective endocarditis, blood and deficiency diseases. This case would appear worth recording on account of its rarity, inasmuch as death so delayed from an arterial source is very unusual.

The Case Described.

I was called in consultation to see a young man of previous good health, aged 29, a school teacher, who stated that while sitting downstairs he experienced a sensation as if something had burst in his head. He immediately rushed upstairs to seek assistance from his family, which he was able to do before collapsing on the bed. He had vomited before my arrival with relief. He looked pale and ill but was able, on effort, to discuss the events leading to the attack. Headache was severe and he resented interference. Examination revealed no typical signs usually associated with apoplexy (no palsies, rigidity, or abnormal reflexes), despite the fact that he had collapsed with temporary unconsciousness. The possibility of a sudden œdema of, or hæmorrhage into, a cerebral tumour came under review, as a warning against a lumbar puncture in the event of a fatal compression of the medulla from increased intracerebral tension. Any risk of syphilitic infection was emphatically denied. His father stated that they had partaken of "pork and beans" for supper, and that he himself had suffered nausea. A diagnosis of food poisoning was tentatively held.

The next morning I found him curled up in bed, but there was a general improvement, the outstanding symptoms being headache, pain behind his eyes, pain in the neck, lethargy, and a dislike of being disturbed. He was perfectly rational. Cramp was felt in both legs. Urine, pulse, temperature, blood pressure were normal. Re-examination of the nervous system revealed the following signs: Full flexion of the head was prevented by pain in the neck. On testing for Kernig's sign there was difficulty in producing complete extension at the knee. The left knee-jerk was more responsive than the right.

The exact diagnosis was puzzling, it being difficult to distinguish between food poisoning with meningismus from acute toxæmia, influenza with abdominal and encephalitic symptoms, and encephalitis lethargica. Cerebral tumour and meningitis from any cause could now be discarded owing to the sudden onset, absence of pyrexia, and general improvement. The possibility of intracranial hæmorrhage without any accompanying pathological state seemed to me remote. Agglutination reactions at the end of the week were negative to enteric and food poisoning bacilli.

Subsequent History and Post-mortem Finding.

The patient continued to improve daily, was out of bed in ten days and, on his own accord, returned to school a fortnight later. In four weeks from the commencement of his illness a similar attack developed, and although the lethargy was more marked, I am informed that the onset was comparatively slow, commencing with headache which drove him to bed. Confusion of thought developed to a slight extent next day, but all questions were answered rationally, and he gave a correct account of his previous attack. The following day he was admitted into the Leeds General Infirmary under Dr. Maxwell Telling, by whose kind permission I am able to supply the following information:—

"When first seen he presented nothing except a painful headache and a resentment of interference. After a little while the signs changed rather suddenly. He developed head retraction, squint, double Babinski sign, absent abdominal reflexes, Kernig's and Brudzinski's signs. As meningitis was suspected, especially as the headache was becoming intolerable, the cerebro-spinal fluid was liberated under greatly increased pressure, presenting a uniformly blood-stained appearance. Very little was allowed to escape. The hæmorrhage had been so severe as to cause coma and death the ensuing day. Post-mortem examination revealed around the meninges at the base altered blood, the result of an old extravasation. There was blood-clot of various ages, most of some standing, in the ventricles and in the floor of the skull. In the right frontal lobe was a mass of blood-clot with much old and new cerebral softening around it. The mass was fully the size of a large walnut. In the substance of the clot, and arising from the right anterior cerebral artery, could be demonstrated a ruptured aneurysm."

Commentary.

It would appear, therefore, that the original hæmorrhage had burst into the ventricles; this belief receives support from the age of the extravasation in the ventricles and the history of unconsciousness and vomiting at the onset. It is difficult to make this assertion in the face of the statement that "an intracerebral hæmorrhage sufficiently large to rupture into the ventricles or subarachnoid space would give rise to permanent cerebral damage (if such case ever recovers)."[1*] The aneurysm in this case probably arose at the bifurcation of the anterior cerebral and anterior communicating arteries; in this position it would be buried between the inner surfaces of the frontal lobes where there is absence of covering by arachnoid tissue. Consequently a rupture would force its way into the frontal lobes. It was afterwards ascertained that the patient was fond of athletics, being used to severe strain as a captain in tug-of-war teams, and I would contend that such excessive strain was a factor in developing his aneurysm at such an early age. It is quite possible for this structural defect to be of fairly common occurrence, and that, without severe exertion, would not give rise to aneurysm or rupture in the absence of arterial disease.

There is little reference to this subject in text-books on medicine, and it is questionable whether it should be confused with congenital aneurysms which are multiple, of small size, and situated chiefly on the circle of Willis, not necessarily favouring the junction of vessels. The favourite site of aneurysms resulting from defective arterial structure is at the fork formed by the anterior communicating and anterior cerebral arteries, and with few exceptions, post-mortem examination has revealed a single aneurysm. Cases arising in young people afford particular interest, and as the condition is not generally recognised in this country, there is bound to be great difficulty in its diagnostic interpretation. Obscure cases in the past have been ascribed to hæmorrhagic meningitis or encephalitis. On the continent a good deal of work has been devoted to its various clinical manifestations, and apart from seven cases recorded by Wilks in 1883, investigations were first published over here by Turnbull[2] in 1914, by Fearnsides[3] in 1916, and by Symonds[1**] in 1924. Associated with hæmorrhage into the subarachnoid cistern, characteristic changes in the cerebro-spinal fluid were described by Froin[4] in 1904. These may be summarised thus: There is increased pressure soon after the onset of hæmorrhage and the fluid contains blood. Specimens taken at intervals do not vary in the admixture of blood and cerebro-spinal fluid; they show no coagulum on standing, and the supernatant liquid is pink, brownish, or even yellow, according to the rate of hæmolysis. The last three features afford contrast

to those met with when dealing with accidental venous hæmorrhage arising during thecal puncture.

Diagnosis and Treatment.

The diagnosis can be simplified by recalling the following salient features: (1) Previous good health or history of a similar attack. (2) A sudden onset with outstanding symptoms of headache, collapse, lethargy, and pain in the back of the neck. (3) If conscious, the patient is rational. (4) Signs of (*a*) deep cerebral lesion, (*b*) cranial palsies, (*c*) meningeal irritation, (*d*) combination of (*a*), (*b*), and (*c*). (5) Absence of pyrexia in first few days. (6) In the absence of trauma the signs do not fit in with any other cerebral condition.

Confirmation of the diagnosis is obtained by carrying out intrathecal puncture, whereby the characteristic macroscopic appearances may be verified. An acute hæmorrhagic meningitis (including anthrax), might produce an even admixture of blood and cerebro-spinal fluid, but the presence of a fibrinous coagulum taken in conjunction with high temperature afford sufficient evidence.

I would allude also to three pathological conditions associated with "cerebro-meningeal hæmorrhage."

The first was originally described by Widal [5] as "*massive albuminuria*," which is present in a certain proportion of cases during the early stages of the illness and is transient in nature. It is evidently the outcome of shock and damage to the nervous system for the kidneys appear free from signs of disease post mortem, while I have found it present in other sudden cerebral disturbances, such as apoplexy and epilepsy. The second is *intra ocular hæmorrhages* into the retina or vitreous, resulting from obstruction to the veins from the retina and optic nerve. Riddoch and Goulden [6] emphasise this clinical sign as the important diagnostic feature, but it has not been constantly witnessed by other observers.[7] [8] The third is *glycosuria*. This has been met with early in the attack, and is ascribed to reflex action from the controlling centres in the brain to the suprarenal cortex. The blood-sugar content is normal. The phenomenon may be correlated to the experiments carried out by Claude Bernard when glycosuria was produced by puncturing the floor of the fourth ventricle.

As regards treatment, it has been suggested that routine lumbar puncture should be performed in order to relieve the high pressure upon nervous tissue, but this procedure must first be carefully considered. The possibility of allowing the medulla to be forced down upon the foramen magnum on releasing the spinal pressure might easily invoke cessation of both respiration and heart beat. Further, a lowering of intrathecal tension might conceivably encourage bleeding from the site of rupture. One must be guided, therefore, by the severity of the symptoms indicating drainage for relief of pressure which is endangering life. Symonds states that "clinical evidence of intraventricular hæmorrhage should therefore be contra-indicated for this procedure, but that, later, it may be judiciously employed to relieve pain and to accelerate recovery." [1]

The prognosis must, of course, be uncertain; severe cases have been known to recover and remain in good health for years. Recurrence of symptoms is common, and any attack may prove fatal.

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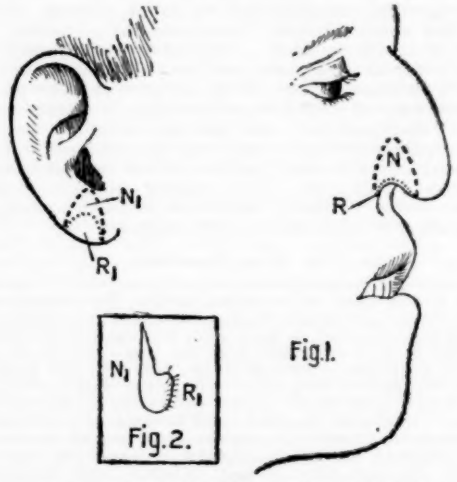
A NEW METHOD OF PARTIAL RHINOPLASTY.

By Dr. E. Dujardin,
COPENHAGEN.

In this method a triangular double piece of the lobus auriculi is applied so as to form one side of the nose and the outside wall of the nostril. The technique and treatment of the case were as follows.

The patient was a young farmer, 23 years of age, who at the age of 13 fell on the ice and injured his nose in such a way that a third of it, the tip and the outside walls of the nostrils, became gangrenous and fell off. In order to form an outside wall for the right nostril I proceeded as follows:—

After disinfecting by brushing with 5 per cent. thymol alcohol, and anæsthetising by novocaine-adrenalin, I cut off a thin skin margin along the lower curved border (see Fig. 1, R), as shown by the dotted line. Along the side of the remaining part of the nose I dissected off a triangular piece of skin (N), very thin towards the borders but retaining



Diagrams illustrating the operation performed.

a considerable amount of subcutaneous connective tissue over most of its area. I then inserted three silk sutures along R—one in the middle of the curve and one at each end—and let the needles hang down for the time being. I next dissected out of the patient's ear lobe a double piece, the smaller part of which (R 1) was formed by the anterior hairy surface of the lobe and was of the same shape as the curved cut edge (R) of the nose, whilst the larger, or posterior, part (N 1) was formed by the hairless back surface of the lobe and had the shape and size of the triangular part (N) which had been cut out of the nose. (In Fig. 2 the double piece is seen in profile.) This piece was then quickly applied to the nose, the bleeding surfaces of the wound were pressed tightly together, and the three silk sutures which had been prepared were applied along the border of R 1. The borders of N 1 were tied to the borders of N by means of four silk sutures. Adhesive plaster was applied, and over this a broader gauze ribbon was tied with mastisol and laid as a supporting wrap round the new outside wall of the nostril, ending in its cavity. The cut wounds of the lobe were joined by two sutures in front and three at the back.

On examining the nose two days later (on Sept. 9th) no hopeful signs were found, for the whole region under the thin adhesive plaster, which was not removed, was like a black crusty mass, suggestive of gangrene, for which eventuality I had prepared the patient. The dark mass might also with a little imagination have been taken for blood crusts. The mastisol gauze was renewed very carefully. On Sept. 12th the region still appeared black and crusty, but the centre of the triangle N 1 had now become bluish-red, and therefore gave some hope of vitability. Plaster and sutures were left intact and only the mastisol gauze was changed. On Sept. 27th the patient told me that his whole face had been spattered the day before with lysol during his work, so that he had been obliged to tear off the whole bandage, and all the silk threads except one had followed the adhesive plaster. The graft, however, had taken, and forms a fairly good passage from the nose to

the cheek, has a natural border covered with epidermis downwards, and is hairy on the surface towards the cavity of the nose.

The advantages of this method of partial rhinoplasty, which, I believe, has not been practised before, are the good cosmetic result and the possibility of operating under local anæsthesia without a subseqent Thiersch transplantation to cover the region from which the piece of skin has been taken. In the case referred to, the lobe of the ear healed pretty well. The patient himself thinks that his ear is improved; at any rate it is smaller.

A NOTE ON

THE IMMEDIATE REPAIR OF THE TORN PERINEUM UNDER LOCAL ANÆSTHESIA.

BY F. J. BROWNE, M.D. ABERD., D.SC., F.R.C.S. EDIN.,

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THE immediate repair of the perineum torn in labour often presents some difficulty in so far as anæsthesia is concerned, and the difficulty is naturally greater in general than in hospital practice, where all facilities for general anæsthesia are available. Without anæsthesia of some kind it is impossible to repair a perineum properly and with strict surgical asepsis. In University College Hospital we have for the past six months been using local anæsthesia entirely for this work and with such success that I feel the method should be generally known and used.

Technique.—The perineum is repaired only after the placenta has been expelled, as suture cannot be carried out or even the stitches nicely inserted before. The patient is put in the lithotomy position, the legs being supported, in private practice, by assistants or by a lithotomy strap of strong webbing, such as can be bought from most instrument makers. The operation area having been cleansed and draped in accordance with modern surgical requirements, the wound in the vagina is exposed from base to apex, together with its continuation in the perineal body. About 4 to 6 drachms of a 2 per cent. solution of novocaine are prepared and 1 minim of 1 in 1000 solution of adrenalin chloride is added for each drachm of the novocaine. A gauze swab soaked in this solution is laid on the raw surface of the wound while the syringe is being charged. An ordinary hypodermic syringe is used with a fairly long needle. In injecting the solution the needle is entered through the raw surface (by this time anæsthetised) immediately under the vaginal mucous membrane or skin of the perineal body. The needle is now carried horizontally outwards immediately underneath the skin (or mucous membrane when infiltrating the vagina) infiltrating as it penetrates so that a weal is formed, the skin overlying the needle becoming slightly œdematous. The infiltration is carried out on both sides at points about half an inch apart until both vagina and perineal body are treated. The injection itself causes no pain if the torn surface has been previously anæsthetised by the novocaine-soaked swab as above described. Suturing can then be proceeded with leisurely. Interrupted catgut sutures are inserted in the posterior vaginal wall, starting at the apex and working downwards. If the tear in the perineal body is at all deep it is better to insert three or four buried interrupted catgut sutures in the depth of the wound so as to bring together the levator ani muscles. Finally, four or five silkworm-gut sutures are inserted through the skin surface of the perineal body. These should take a wide bite on each side, should go deep to the deep surface of the wound so that no dead space is left, and they should not be tightly tied. Their ends are left long and knotted together. A sterile gauze dressing and vulval pad are then put on. While inserting the stitches it is better to ask someone to talk to the patient in order to distract her attention, thus getting good relaxation. The total quantity of novocaine solution used, including that taken up by the gauze swab, is about 4 to 6 drachms, depending on the extent of the tear.

After-treatment.—The patient is allowed to sit up in bed next day. After the bowels are emptied or urine passed, the vulva is sponged with 1 in 4000 solution of perchloride of mercury. No dusting-powder is used, and the patient is not douched. On the evening of the second day 2 tablespoonfuls of liquid paraffin are given; this is repeated in the morning and at noon of the third day, and on the evening of this day 1 oz. of castor oil is given. The bowels act on the morning of the fourth day, and no enema is required or given. On the tenth day the silkworm-gut stitches are removed.

No originality is claimed for the use of local anæsthesia in immediate perineal repair, but in several text-books of obstetrics consulted I can find no mention of it. The advantage of the method is that perfect anæsthesia and relaxation are obtained without the administration of a general anæsthetic with its attendant worry, risk, and subsequent vomiting and discomfort. Healing has been in all cases good.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF OBSTETRICS AND GYNÆCOLOGY.

A MEETING of this Section was held on June 15th, Mr. COMYNS BERKELEY, the President, in the chair.

Prof. B. STROGANOFF (Leningrad) communicated a paper, which was read by Mr. W. GILLIATT, on the

Standard of Results in the Treatment of Eclampsia.

Prof. Stroganoff began by quoting figures from various countries to prove that eclampsia was still one of the greatest dangers that might befall the child-bearing woman. In the United States 5000 women died of it annually and, while 6000 died of puerperal sepsis, it was unusual in these cases to lose the child as well. In eclampsia as many babies as mothers died, so that the total loss of life was much greater. Lees had stated that 25,000 women died annually in childbirth, and Moscher had estimated that one woman in every 1000 lost her life. Dr. Janet Campbell's figures for this country put the rate at 4·11 per 1000, or one in every 342. Improvement was in progress in Germany as the result of adopting the Stroganoff method (the removal of irritating influences, narcotics, and the maintenance of the functions of the kidneys, skin, lungs, and heart). Prof. Zweifel, of Vienna, had had a mortality of 8·5 per cent. in 316 cases, and Prof. Leopold had reduced his maternal mortality from 19 per cent. to 8 per cent. and the fœtal mortality from 55·7 per cent. to 18·6 per cent. Jacobs, using the prophylactic method, had only had three deaths in 48 cases; two had been moribund on admission and one had died of inflammation of the lungs. Not one of them had had a single fit after the beginning of treatment. In America Williams, at the Johns Hopkins Hospital, had reduced mortality from 22·8 per cent. to 13·3 per cent. Prof. Stroganoff's own figures for 360 cases showed a maternal mortality of 6·6 per cent. and a fœtal mortality of 21·6 per cent. In his opinion the prophylactic method, properly applied, should give a mortality-rate in eclampsia of between 1 and 2 per cent., or, if neglected and infected cases were included, of between 2·5 and 4 per cent. As yet no one had carried out the treatment in a sufficient number of cases. Some people had had bad results, but this was because the method was not used strictly or correctly. Altered régime meant impaired

results. A fixed scheme of administration of narcotics was no part of the method, and it was essential to vary the plan with the patient's condition. Where the results had been bad he had usually found a want of individuality.

Prof. Stroganoff's own most recent general mortality-rate was 2·6 per cent. Out of 300 cases eight had died, and in only one had it been impossible to control the convulsions. Her heart had been found post mortem to be permeated with fat, and, among other disabilities, she had had bronchitis, perisplenitis, chronic nephritis, and multiple hæmorrhages. The fœtal mortality was 6 per cent. In 40·3 per cent. of the 300 cases there had not been a single fit after commencing treatment, and only 15 per cent. had had four or more fits. No maternal deaths had been due to the treatment; on the other hand, 4 per cent. of mothers died after forced delivery. The operative deliveries had only been 50 per cent. Rapid recovery had been general. He analysed the eight deaths as follows: (1) Intractable hæmorrhage. (2) Two fits at home, eight in hospital. Forty-eight hours in labour, died of septicæmia. (3) Placenta removed manually and uterus ruptured. (4) One fit before admission and four after delivery; venesection, heart weak; fits controlled, died of double pneumonia. (5) Several fits at home, admitted comatose, stopped breathing under chloroform; four more fits, controlled, died two days later. (6) Sixteen fits at home, admitted moribund. Eclampsia came on after labour. (7) Two fits at home, deep coma, pulse-rate 110 and respiration-rate 40 on admission. No fits after admission, but went blue and died suddenly. (8) One fit at home and 11 in hospital, two after labour. Temperature 101·8, rising to 104; inflammation of the lungs and pleurisy.

Prof. Stroganoff then quoted a number of statistics from different countries to show the improvement since the adoption of his method. Eclampsia in hospital appeared to be more severe, but the results were more favourable. He considered that Cæsarean section often caused death and nearly always injured the patient unnecessarily. The prophylactic method was not ideal and could be improved; nevertheless its results were so much better than those of other methods that to many people they seemed unattainable. The quartz lamp was very important for the eclamptic patient. It involved no danger to the heart or nervous system and produced marked vasodilatation. While chloral hydrate could not be dispensed with, luminal or hedonal might be substituted for it after the fits had been controlled for eight or ten hours or where chloral was not absorbed. These two preparations had the advantage of not being dangerous to the heart and of being capable of administration subcutaneously or intravenously. There was some doubt whether chloral given rectally was absorbed. His opinion of magnesium sulphate was not favourable. About 20,000 lives were lost every year from eclampsia. The best results in this condition were achieved by the prophylactic method, but hardly anyone had used it strictly or fully. If they had, their results would have been better. The technique was very important and could only be learned by the bedside. Failing that, however the telephone consultation was a great help.

Discussion.

The PRESIDENT said that in this country it was not a fact that Prof. Stroganoff's results were unappreciated or that his treatment was untried. He (Prof. Stroganoff) had been most anxious that this paper should be read in order that the importance of the method might again be insisted on in the medical press.

Prof. FLEMING GOW spoke of conditions in India, where the obstetrician did not usually see his patient until she had had eight or ten fits and was comatose. The mortality was well over 20 per cent., but had decreased slightly since the adoption of a modified Stroganoff method. There seemed to be local variations. In Madras the usual method was venesection with Stroganoff; in Bengal, however, it was most unusual to find a blood pressure over 160, so that venesection was little used. Chloral hydrate was given in rectal saline. Cæsarean section for eclampsia had been abandoned, but was useful when eclampsia was complicated with the under-developed pelvis of the young primipara of 13 or 14.

Prof. MCILROY asked what Prof. Stroganoff's latest treatment was, and recalled that when he was in England there had been almost no cases of eclampsia for him to treat. He had ascribed the rarity of the condition to antenatal and prophylactic treatment. There ought to be a standardised form of treatment, Prof. McIlroy thought, particularly as eclampsia was largely treated by junior obstetricians. For about three years there had been no case of eclampsia at the Royal Free Hospital, and then a fulminating case had occurred. These must always turn up from time to time and provide a certain mortality.

Dr. E. H. ALTOUNYAN described the case of an Armenian girl of 18 who had failed to respond to chloral, venesection, and evacuation of the uterus, but who had benefited by intravenous administration of glucose, 300 g. in a 4·7 per cent. solution in distilled water. He had successfully repeated this treatment for a girl of 10 suffering from toxæmic nephritis after chicken-pox.

Mr. L. C. RIVETT said that the only case of eclampsia Prof. Stroganoff had found in London had been at Queen Charlotte's Hospital, where full record had been kept. Since then feeble efforts had been made to carry out his treatment, and it had been modified by every sister, every resident, and every member of the staff. In consequence the results could not be reported. At St. Mary's Hospital for the East End, however, Mr. Rivett had managed to keep his own modification unmodified and had had only three deaths in 44 cases. He endorsed Prof. McIlroy's plea for a uniform treatment. In answer to a question, he said that his modification included the use of chloroform.

Dr. DOROTHY LOGAN compared the value of glucose with the effect of cane sugar as a diuretic in certain cardiac cases, and asked for information about the excretion of chlorides. She cited a case where a patient who was under observation in hospital for another condition, and had developed eclampsia without any warning, despite the daily urine tests.

Mr. GILLIATT said that the chloride excretion was the basis of the anti-salt diet. He described a diabetic woman who became pregnant with twins. During her pregnancy she had required less insulin than before or after; apparently the pancreases of her babies were "doing their bit" for her. She had suddenly stopped excreting chlorides and almost "blew up" with enormous œdema, extending up to her waist. She had never had a fit nor albuminuria. Cæsarean section had been successful.

The PRESIDENT mentioned the successful results obtained at the Zürich Clinic, where Cæsarean section was performed directly the patient had the first fit.

Prof. LOUISE MCILROY reported a case of

Dysmenorrhœa due to Calcification of the Ovary.

The patient, aged 24, had suffered for a year from pain before, during, and after the period, lasting in all about a fortnight. She had consulted her doctor about a year ago because the pain was getting worse and the flow increasing. She had also suffered from dyspepsia. The menstrual pain was worse when she was sitting down than when she was moving about. All remedies had failed and a rectal examination had revealed a stony-hard tumour in the pelvis. The girl had looked perfectly well when seen by Prof. McIlroy. Operation had revealed a hard mass lying free in the pouch of Douglas with the tube forming its pedicle. Dark veins ran over its surface; it was too hard to cut, and X ray showed practically nothing. The patient's recovery had been uninterrupted, and she wrote this week that she had never had ache or pain since the operation, and had been married six months.

The PRESIDENT remarked that he had never seen a similar case, and asked why the pain had been worse whilst sitting down.—Prof. MCILROY replied that this was probably because the tumour was right down in the pouch of Douglas. She had not been able to find any similar cases in the literature.—Dr. F. E. TAYLOR

suggested that in such a young patient the tumour was more probably a degenerated dermoid than a fibroid.

Mr. CLIFFORD WHITE read a short communication on

Vulval Metastases from Pelvic Growths.

He said that it was of clinical importance to realise that metastases of the lowest part of the vagina might occur in cases of carcinoma of the uterus and ovary. In the cases he reported there was no question of gross involvement of the vaginal vault.

The first patient was a 7-para of 56 seen in December, 1926. Her menopause had taken place eight years before, and for four months she had had a blood-stained discharge. There was a tumour in the lower abdomen and what appeared to be a small papilloma in the vulva. After three weeks' treatment for diabetes she was operated on, and the right ovary was found to be 10 cm. in diameter, while the left was about 5 cm. Both were adherent to the uterus and intestine. The tumours and the body of the uterus were removed and no other foci were found in the abdomen. The nodule in the vaginal vault had by now increased in size to some 3×2 cm., and was raised and purple. It proved to be an adeno-carcinoma identical with that of the ovary. The patient died three months later.

The second case, a multipara of 70, was practically moribund when first seen. She had had abdominal pain and swelling and a blood-stained discharge. In addition to a semi-solid tumour and free fluid in the peritoneum she had a soft mauve nodule just inside the vulva. She died in a few days and no pathological material could be secured, but the clinical appearances were almost exactly like those of Case 1.

The third patient, seen in May, 1927, was a multipara of 40 who had had multiple uterine fibroids causing menorrhagia. She had had a panhysterectomy and a small adeno-carcinoma had been found in the body of the uterus after removal. She had been well until February of 1928, when she had noticed a pink discharge, and a pale purple, soft, raised growth identical with those of the two previous cases. The nodule proved to be a typical adeno-carcinoma like that of the uterus. The inguinal glands were excised and she was treated with deep X rays.

Mr. White said he had never met a case before the first of these three, and that their occurrence was difficult to explain. The literature recorded some secondary deposits of chorion epithelioma, but he had found no account of adeno-carcinomatous metastases. He would like to know if there was any anatomical explanation of their occurrence.

The PRESIDENT said he had seen cases of chorion epithelioma, but never cases like these.

Dr. CHRISTIE BROWN described three similar cases seen at the London Hospital. One was an adeno-carcinoma in a woman whose uterus had been removed for this form of growth 15 months before; two were secondary hypernephromata implanted just behind the urethra, possibly carried there by the urinary tract.

Reviews and Notices of Books.

THE NELSON LOOSE-LEAF LIVING SURGERY.

Edited by ALLEN O. WHIPPLE, M.D., Professor of Surgery, College of Physicians and Surgeons, Columbia University; Director of Surgical Service, Presbyterian Hospital, New York. Associate Editor, FORDYCE B. ST. JOHN, M.D., Professor of Surgery, College of Physicians and Surgeons, Columbia University, New York. Volumes I.–IV. New York: Thomas Nelson and Sons. 1928. $125 for complete set of 9 volumes.

BOOKS on surgery can be classified roughly into four types. There is the text-book which appeals to the undergraduate, the treatise for the general practitioner, the eclectic work of limited scope for the practitioner-surgeon, and, finally, the comprehensive system which strives to keep the consulting surgeon up to date, leaving out no methods or observations which have the slightest pretensions to consideration from the point of view of advancing science or art. The work under review belongs to the last class.

The task of compiling such a system must always be beset with endless difficulties, and very few works attain or maintain the standard set up by their editors. There is bound to be unevenness in the presentation of different branches of the subject when the services of numerous contributors must be requisitioned. It is high praise, therefore, to say that, judging from the first four volumes, this system of surgery bids fair to achieve very great success. There is not a single section that does not reach a high standard of effort, and the selection of authors has been admirable, the list including many of the greatest names in American surgery. How large the total number of contributors must be can be gauged from the fact that in these four volumes alone (there are to be eight in the completed work) more than 40 authors supply articles.

In Vol. I., physiology, pathology, bacteriology, and anæsthesia are discussed. Notable contributions are by J. E. Sweet on physiology, and by F. L. Meleney, who gives an account of the bacteriological and immunological aspects of surgery. Sweet's article is distinctive because of its clear and critical outlook, Meleney's because he brings to life a part of surgery which is often tedious to read about, by illustrating his statements with actual case histories. The names of J. T. Gwathmey and Gaston Labat as authors of the articles on general and local anæsthetic methods suffices to guarantee that these subjects are adequately dealt with. The arrangement of the matter in this volume, and indeed in the other volumes, is open to criticism; it is not always easy to find the actual information desired. For instance, there is no clear, full account of tetanus in any one place. Excessive subdivision on the one hand, and occasional sweeping generalisations on the other, must be accounted among the few drawbacks of this work. They complicate rather than simplify the presentation of surgery, especially when the services of so very many writers are involved. Thus, in Vol. II. appear articles on the surgery of tuberculosis and the surgery of malignant disease. In this country we do not think of surgery in such compartments; they do not seem natural divisions. Yet it must be admitted that one of the most interesting sections in the book is that by Ashhurst on the surgery of malignant disease, and the reader of this chapter may feel that there was justification for creating such a section. The chapter in this volume by Wilder Penfield on the principles of the pathology of neuro-surgery is exceptionally good, while G. H. Semken contributes an unusually clear account of the surgery of the neck. G. W. Crile, C. A. Elsberg, and B. Stookey also write in this volume.

Vol. III. contains orthopædic surgery, the surgery of the limbs and vascular system, and is less satisfactory than the rest. The orthopædic section particularly is sketchy, and practical details of some of the simpler orthopædic procedures are lacking. With regard to dislocations and fractures, from such a large treatise the reader expects help in real practical difficulties, and does not always get it. For instance, there is no description of the open operation for an unreduced dislocation of the shoulder, nor of one for habitual dislocation. In a special section on anæsthesia in the reduction of fractures local novocaine anæsthesia is extolled, but no description of how to apply this method is to be found. Spinal anæsthesia for leg fractures is not mentioned; perhaps the author thinks it too dangerous to be justifiable. Hugh Auchincloss's excellent article on the surgery of the hand is illustrated with a really splendid collection of drawings; it is marred only by one omission, the failure to tell us more about the restoration of function in the hand after septic infections, and the prognosis in these cases. An adequate account of amputations is supplied, but the chapters on varicose veins and osteomyelitis are not inspiring. There seems to be no mention of the injection treatment of varicose veins, and the reader has to turn

to Leriche's scholarly article on the vasomotor changes in blood-vessels to find an account of his method of treating varicose ulcers. It is interesting to read that Leriche has abandoned operations which remove sympathetic ganglia. Vol. IV. contains the surgery of the lymphatic system, the œsophagus, heart, pericardium, and hernia. In this volume we return to a uniformly high standard of achievement. The reader is not likely to search in vain for desired information in Torek's article on the œsophagus, or S. Erdman's article on hernia, whilst E. C. Cutler and C. S. Beck have written perhaps the fullest and most up-to-date account of heart surgery that exists.

The loose-leaf system has not only the great advantage of allowing new advances to be added from time to time, but it permits the revision of deficiencies which are bound to be present in any large book of composite authorship. If the remainder of this great work fulfils the promise of these earlier published parts, an extraordinarily reliable and satisfying treatise on present-day surgery will be at our disposal.

EPILEPSY.

By L. J. J. MUSKENS, M.D., Amsterdam. London: Baillière, Tindall and Cox. 1928. Pp. 435. 27*s.* 6*d.*

THE English edition of this book is not a mere translation, but has been prepared, revised, and brought up to date under the close supervision of the author by Mrs. W. Shaw Dunn. There can be few investigators as well-fitted as Dr. Muskens to write a book which embraces both the physiological and the clinical aspects of epilepsy. The volume under review is the fruit of many years devoted not only to the experimental study of convulsions, but also to clinical research upon epilepsy which began when the author was a pupil of Hughlings Jackson, Gowers, and Horsley. The result is a contribution to knowledge which, though distinctive in its outlook, is nevertheless in the direct line of the English tradition of neurology, and the fact that Sir Charles Sherrington has written a foreword is sufficient evidence of its importance from the physiological standpoint.

Part 1 of the book consists of an investigation of the fits induced in normal animals by convulsant drugs, especially by monobromide of camphor. It begins with a study of the "myoclonic reflex," which is the foundation-stone of the author's conception of the epileptic fit, and is the name given to a localised shock-like muscular contraction which occurs in a small proportion of normal cats in response to a tactile stimulus, such as an unexpected touch upon the skin of the back or a limb, or an acoustic stimulus such as a loud noise. Dr. Muskens found that monobromide of camphor enabled this reflex to be elicited in all cats, and that increasing doses of the drug caused: (1) a spread of the motor response so that all the muscles of the body might become involved, (2) a shortening of the refractory period, and (3) a tendency to after-discharge. Further, animals under the influence of this convulsant might exhibit spontaneous myoclonic movements which occurred in the absence of tactile and acoustic stimuli, and after sufficiently large doses they suffered from generalised epileptiform convulsions with loss of consciousness. These facts lead Dr. Muskens to take the view that the epileptic attack is the "central after-discharge" of a myoclonic reflex, which occurs when the maximal exaltation of the reflex is produced by a convulsant drug. In Part 2 the author describes the effect of experimental lesions of different parts of the nervous system upon the character of convulsions experimentally produced. Part 3 is devoted to epilepsy in man, ætiology, clinical features, and treatment being discussed. In dealing with human epilepsy Dr. Muskens naturally lays stress upon myoclonic epilepsy in its varied forms and the occurrence of myoclonic jerks from time to time in patients subject to major epileptic attacks, regarding these as phenomena which link epilepsy in man with experimental convulsions in animals.

The most important part of the book is the author's experimental work and the theory of the nature of epilepsy which he builds upon it. He has undoubtedly shown that a progressive heightening of reflex excitability precedes the development of the fits induced in animals by convulsant drugs, and is associated with a lowering of the threshold of different parts of the brain to faradic stimulation. This is a strong argument in favour of the theory that such convulsions are essentially widespread neural discharges; it does not necessarily follow, however, that the convulsion is of a reflex nature, a view which does not account for the associated loss of consciousness. Neither are the tonic elements of the epileptic fit covered by Dr. Muskens's theory; he proposes to regard these as a fusion of the clonic movements during their most explosive phase. He does not discuss the nature of the purely tonic fits (Hughlings Jackson's "cerebellar fits") which sometimes occur in man and which seem hardly explicable as a metamorphosis of myoclonic movements. Dr. Muskens has not escaped a further difficulty which besets all experimental investigators of epilepsy. Convulsions induced by drugs are certainly toxic and the view that the fit detoxicates the animal is permissible, though it may seem unduly teleological. But it is not justifiable to conclude without independent evidence, which has never been brought forward, that epileptic fits in man are also toxic in origin.

Many neurologists will consider that Dr. Muskens's physiological explanation of a convulsion is too simple and does not sufficiently take account of the complexity and multiformity of fits both in animals and in man. However, he has produced an outstanding contribution to the experimental study of epilepsy, and has submitted a sound and well-balanced discussion of its clinical aspects which is well worth reading.

A TEXT-BOOK OF BIOCHEMISTRY.

For Students of Medicine and Science. By A. T. CAMERON, M.A., D.Sc. Edin., F.I.C., F.R.S.C., Professor of Biochemistry, Faculty of Medicine, University of Manitoba. London: J. and A. Churchill. 1928. Pp. 462. 15*s.*

FEW English text-books have covered the same ground as this one by Prof. Cameron, which is worthy of attention. It is a well-packed volume of 450 pages, and deals adequately with the subject of biochemistry as a whole, and should be of great value to medical and physiological students. The first section consists of a well-written introduction and two chapters dealing with catalysis and pH respectively. In the second section there is a series of chapters on the biochemistry of the foodstuffs and their derivatives. The greater part of this is well-worn ground, and the author perpetuates one or two traditional errors that have appeared in text-books from time immemorial. For example, on p. 101 he states that "histidine is the only amino-acid to give a biuret reaction." We wonder how many of the people who have repeated this statement have actually tried the reaction. The third part of the book deals with the chemistry of digestion, the circulation, and the excreta. Then follows a long section devoted to intermediate metabolism, which, on the whole, is a very good summary of what is already known of this branch of the subject; the paragraph on insulin is rather disappointing. The fifth section contains two chapters, one on the chemistry of reproduction, and the other—a very short one—on the controlling agents of the metabolic processes. Section VI., on quantitative metabolism, includes descriptions and photographs of the Russell Sage calorimeter for the accurate estimation of basal metabolism. There is also a more adequate chapter on diet than is usually found in a text-book of this description. The author has included a few chapters

on "borderline subjects" in the last section, in an attempt to "break down the watertight compartments of the modern sciences." These have proved of particular interest and add considerably to the value of the book.

Prof. Cameron writes well, giving a clear idea of the scope and aims of biochemistry, and at the same time as much detailed and technical information as is necessary for the student. Trouble has been taken to make clear the meanings and sources of some of the very technical terms. Such an excellent book well deserves the success which Prof. Swale Vincent, in a foreword, desires for it.

ACUTE ABDOMINAL DISEASE.

Clinical Researches in Acute Abdominal Disease. Second edition. By ZACHARY COPE, F.R.C.S. Eng. Senior Surgeon to Out-patients, St. Mary's Hospital. London: Humphrey Milford, Oxford University Press. 1927. Pp. 214. 10*s.* 6*d.*

THE fact that this volume has so soon required a second edition is evidence of the interest it has aroused. It consists of a series of short articles on various points connected with acute abdominal disease. They are all original and valuable for their practical suggestions. Of the new chapters which appear in this edition, those on extravasation of bile and on shock are of the greatest interest. Surgeons may not agree with the author's views on shock, but they will appreciate the importance of the author's suggestions for its prevention and relief. The book should be studied by all who may have to deal with acute abdominal emergencies.

TRAVAUX ET MÉMOIRES.

Tome deuxième. By PIERRE MARIE. Paris: Masson et Cie. 1928. Pp. 393. Fr.30.

THE second volume of Prof. Pierre Marie's reprinted contributions contains his work on the Charcot-Marie variety of amyotrophy, on hereditary cerebellar ataxia and cerebral lacunes, and on more than 40 other topics of neurological and general interest. Those in all countries who have been pupils of this master of neurology, or who have followed his clinicopathological method, will welcome the chance of possessing in book form his opera omnia, which cover a period of 40 years and more, couched in a scientific language of conspicuous clarity, and representing an abiding addition to neurological learning such as few have ever equalled.

POSTURAL REFLEXES IN MAN.

Die Lagereflexe des Menschen. By HANS HOFF and PAUL SCHILDER, Psychiatric-Neurological Clinic, University of Vienna. Vienna: Julius Springer. With 20 illustrations. Pp. 182. R.M.12.

THE impetus given to clinical neurology by the physiological work of the late Prof. Magnus and his collaborators is having its effect in the output of clinical researches dealing with postural and correcting (or righting) reflexes as seen in man in normal and diseased states. To this study the slender monograph of Dr. Hoff and Prof. Schiller forms an appropriate contribution. They have made a special investigation of such reflexes in normal persons at different ages (infants, juveniles, adults), and have occupied themselves with the behaviour of these reflex reactions in various clinical conditions (cerebellar lesions, chorea, tabes, athetosis, hemiplegia, Parkinson's disease, epilepsy, the psychoses, and so forth). Several of their clinical tests are ingenious and may be new to English neurologists; at the same time it is evident that the application of the whole range of test reactions to some at least of the cases here described is comparatively useless. The authors seem themselves to be aware of this from their frank admission that a given reflex reaction has in such and such a case "no practical significance." Other investigations in their series contain no novelty and constitute merely an elaboration of some accepted phenomena, for example, those which bring out the physiological disorder of cerebellar disease. A summary at the end of the brochure deals in tabular fashion with some 20 types of reaction, subjected to painstaking scrutiny. A detailed criticism of the findings in the various nervous conditions already mentioned would lead to a highly technical discussion: we may, however, admit the observational value of the author's work without assenting to their interpretation of it in terms of Magnus and de Kleijn reflexes.

ACUTE APLASTIC ANÆMIA.

By A. HAYES SMITH. London: H. K. Lewis and Co. 1928. Pp. 80. 6*s.*

THIS book contains a detailed account of a case of aplastic anæmia with recovery occurring in a child aged 2 years. Numerous therapeutic products of one sort and another were used in the treatment, including a preparation of liver for subcutaneous injection. The author attributes recovery to this last, and therefrom deduces the existence of a liver "hormone" having an influence upon the bone-marrow. In the light of recent experience few will be found to quarrel with this conclusion, but the steps by which the author attains it are open to criticism. He quotes from the literature two further cases of aplastic anæmia in children in which recovery occurred without the use of liver. It is the experience of most of those who have had occasion to deal with this condition since liver therapy for pernicious anæmia came into vogue that it exercises no influence upon the course of anæmia of this type.

FRACTURES AND DISLOCATIONS.

Fracturen und Luxationen. Ein Kurzgefasstes Lehrbuch für Ärzte und Studierende von Dr. Med. K. H. BAUER, A.O. Professor für Chirurgie an der Universität Göttingen. Berlin: Julius Springer. 1927. With 237 illustrations. Pp. 236. R.M.16.80.

THIS book, as its title implies, is a manual for students and practitioners and makes no pretension to any extensive exposition of the subject. The pathology of lesions bulks larger than the treatment, but the therapeutic measures recommended are sound and, generally speaking, are within the reach of the general practitioner. The illustrations are good and clear. Figs. 208 and 209, which purport to represent the walking splint of Bruns, are really representations of Thomas's knee-splint and patten. The section on operative treatment of fractures is very meagre. Tongs extension is recommended, but the methods of Lane, Hey Groves, Delbet, and Albee are ignored, probably because they require operative facilities not often within the reach of a general practitioner. Dr. Bauer is still impressed by fear of pneumonia and other troubles which were formerly the bugbear of the surgeon who had to treat fractured femur in the elderly, although up-to-date surgeons such as Delbet keep their cases of fracture of the neck of the femur recumbent for three months and are able to record an almost negligible mortality.

MEDICAL TUBERCULOSIS IN INFANCY.

La Tuberculose Médicale de l'Enfance. By M. PÉHU and A. DUFOURT. Paris: Gastoin Doin and Cie. 1927. Pp. 732. Fr.75.

Drs. Péhu and Dufourt have produced an excellent volume on the tuberculosis of infancy from the point of view of the physician. No attempt is made to deal with surgical tuberculosis. The book covers a wide range and attention is paid to those details which the practitioner needs so much but does not always get in text-books. The information given is well up-to-date; even the new filtrable virus work being briefly described. Social hygiene and

preventive measures which form a very large part of the study of infantile tuberculosis, are fully dealt with, such efforts as the Graucher system being clearly described. The clinical pathology in the book is disappointing and the information given on treatment is not as full as it might be. An appendix of illustrative X ray plates is given, the index is good, and bibliography will satisfy the research student. No illustrations are given in the text. On the whole, this is a welcome relief; books on tuberculosis, as a rule, are overweighted by the large number of uninspiring reproductions of apparatus which convey little to the reader. We can recommend this book as a piece of conscientious work. It is written clearly and logically and is a model of condensation.

PRINCIPLES OF BACTERIOLOGY.

By A. A. EISENBERG. Fourth edition. London: Henry Kimpton. 1928. Pp. 228, with 40 text figures. 10*s.* 6*d.*

THIS excellent book would be better called "Elements" than "Principles"; it is a guide across the threshold of bacteriology and has nothing to do with the general propositions to which that science may ultimately reduce itself. It has been written, primarily, for use in training schools for nurses in the United States; and devotes a good deal of space to practical details, contemplating the possibility (already we believe to some extent realised in practice) that nurses may also function as laboratory assistants. Whether it will be of value for the same purpose in the more conservative English schools is perhaps open to question, but it is a good introduction to practical medical bacteriology for laboratory attendants, elementary students and anyone else who wants to get some knowledge of the subject, and is prepared to take a little trouble about it.

PHARMACOTHERAPEUTICS.

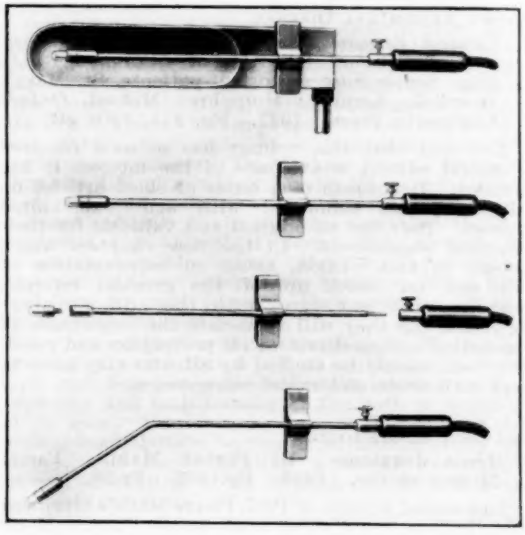
By S. SOLIS-COHEN, M.D., and T. S. GITHENS, M.D. London and New York: D. Appleton and Co. 1928. Pp. 2009. 63*s.*

THE first 400 pages of this book are given up to such subjects as drug influence, assay, and the sources and preparation of drugs. Valuable chapters are included on prognostic indications, symptomatic indications, absorption, elimination, and incompatibility. Under the heading of "Schools of Medicine" we are told the theory and practice of homœopathy, eclecticism, and dosimetry. The remaining 1600 pages are devoted to a systematic description of groups of drugs. Under each heading the history, chemistry, materia medica, therapeutics, and toxic action of the drug concerned are discussed. The authors have been most thorough and are well up to date. For example, a critical discussion of the use of such drugs as quinidine sulphate and phenylhydrazine hydrochloride is included, and also the value of non-specific protein therapy and the scarlet fever immunity test. The new work on the parathyroid and ovarian hormones is set out, and the photo-synthesis of vitamin D, which was not achieved until after the book went to press, is anticipated. Some confusion is caused by the difference in terminology of the U.S. or the British Pharmacopœias. Thus liquor arsenicalis (B.P.) becomes liquor potassii arsenitis (U.S.X.), and we find two entirely distinct preparations known as liquor arsenicalis pearsonii and liquor arsenicalis clemens. It is surprising that the leech should be so curtly dismissed by authors who define the rational method of therapeutics as "The giving of the right drug to the right patient in the right dose, and the right way at the right time." The British reader will be irritated by some of the expressions used, such as "nerve booster," but will appreciate the value of the book as a whole. It is very well indexed, and our only criticism of the production concerns the poor quality of the paper used.

New Inventions.

ILLUMINATORS FOR OPERATIVE RADIUM WORK.

A CLEAR operative field being of considerable importance in those operations of access which have as their object the exposure of deep-seated tumours for the insertion of radium, demands in many cases special means of illumination. To facilitate this, a series of illuminators (see figure) has been designed.



The construction of these permits of their attachment to speculæ, retractors, &c., used in the surgery of access, and to special vaginal speculæ used in the treatment of cancer of the cervix. Each carries a detachable lamp, while the current (4 volts) is conducted by means of a cord, detachable as shown.

The instruments are made by the Medical Supply Association, 167, Gray's Inn-road, London, W.C.

ARTHUR B. SMITH, M.B., F.R.C.S.Edin.
SYDNEY M. SMITH, M.B., Ch.B. Edin.
Harley-street, W.

A NEW DRAINAGE-TUBING.

THE modification of drainage-tubing here illustrated consists simply of a solid rib (R) of rubber on opposite sides of the tube, to enable a stitch to be passed through without puncturing the lumen. De Pezzer tubes, indeed any kind of rubber-tubing used for drainage, could be easily treated in the same way. When a tube draining a jejunostomy, a cæcostomy, or a urinary bladder is anchored by a stitch, there is often a little leakage through the puncture, which tends to grow larger by tension. The escape of even a small quantity of fluid from the small bowel, a septic gall-bladder, or a severely infected urinary bladder, often causes a troublesome dermatitis and infection of the rest of the wound. This modification to the tube is designed to obviate such troubles. The tubing may be obtained from Messrs. Chas. Thackray and Co., of Leeds.

Swindon. H. H. GREENWOOD, F.R.C.S. Eng.

THE LANCET.

LONDON: SATURDAY, JUNE 23, 1928.

MEDICAL CARE OF SCHOOL-CHILDREN.

AMONG the real social advances of the present century in this country the concerted national effort for making a scientific study of children during the growing age is one of the most important. Although only the fringe of the net enveloping and hiding the factors of healthy growth has so far been touched, yet we already see, in the enhanced cleanliness, well-being, and physique of our children much encouragement for still further attempts to solve the difficulties inherent in the problems of life. But if no country in the world can show such an extensive and coördinated scheme of school medical service and of child welfare generally as exists with us, we must not forget that many gaps and anomalies are still apparent in that scheme, a position which was revealed in the recent debate in the House of Commons when the House went into Committee of Supply on a vote for £26,215,828 for salaries and expenses of the Board of Education. Mr. TREVELYAN, in moving to reduce the vote by £100, said that although the value of nursery schools so clearly shown in Sir GEORGE NEWMAN'S 1926 report was fully recognised by all, yet there were at present only 26 of these schools with a population of 1367 children out of 2,000,000 children between 3 and 6 years of age. Other speakers followed, pointing out that public opinion was now ripe to support the Board in giving a lead to local authorities for a favourable consideration of any proposals for the extension of these schools. In proof of the practical work done by the schools Viscountess ASTOR said that the average proportion of children entering them at 2 years of age, who were rickety, was from 80 per cent. to 90 per cent., but that within one year all cases of rickets were cured in the open-air régime of the nursery school. She added that the average proportion of the diseased and delicate entering elementary schools at the age of 5 years was from 30 per cent. to 40 per cent., while the average proportion of children who had attended a nursery school between 2 and 5 years of age was 7 per cent. The debate led to an expression of opinion from Lord EUSTACE PERCY, President of the Board, as to the relative merits, in dealing with malnutrition, of the giving of school meals only on medical certificate rather than merely giving a midday meal to all children whose parents were necessitous. His view was that malnutrition was a medical question and should be kept on that basis. The Duchess of ATHOLL, Parliamentary Secretary to the Board, defended the disallowance of the travelling expenses of school-children between the buildings and the playing-fields on what may be considered an exactly opposite view; for if the Board consider that money should be spent on general facilities which would provide opportunities for the children in schools rather than upon providing travelling expenses for individual children, the decision exactly cuts across the basic medical view that treatment—and athletics constitute treatment—should be directed to the places where it is required individually.

There is no longer dissociation between education and child hygiene; the balance between educational needs and the physiological demand for movement and play in children is being adjusted, and already in most places an organiser of physical training is working hand-in-hand with the school medical officer. The cost of apparatus for athletic and remedial exercises is already part of the educational outlay, but space for recreation is sadly lacking in most large towns, though such voluntary efforts as those of the Playing Fields Association are now producing good results. But the demand for playing grounds far exceeds the supply. It is, too, in just those areas where recreational facilities are most needed that they are lacking, and the children in such areas cannot afford the expense of travelling nor can this expense be incurred by the local authority. While the competitive spirit is necessary to stimulate interest and endeavour, it is not the outstanding performers who travel to the playing-fields; a whole class goes at a time, and those most competent to judge are unanimously of the belief that the mental, moral, and physical results more than justify the small expense of travelling. More playing-fields and more nursery schools are clearly needed. The activities of the nursery school are medical, social, and educational and aim to provide the right environment for the proper development of very young children. Sir GEORGE NEWMAN says: "The remarkable improvement in the health and nutrition of children attending nursery schools may be attributed to medical supervision, a suitable dietary, sufficient rest, and an open-air régime." For the most part children are selected for nursery schools either on social or medical grounds, so that the incidence of defects are heaviest on such children. Lady ASTOR'S figures of 80 per cent. to 90 per cent. of rickety children entering such schools appear to be high, and sufficient statistics are not yet available for proof of them; it is, however, true that rickets does disappear from the children attending those schools. Moreover, those children are of the age when many observers hold that infective conditions such as tuberculosis and rheumatism take root, and it might well be that the additional nurture provided can lessen or prevent much of the present incidence of these diseases. The nursery school age embraces those years of early character formation which may mould the ultimate personality for better or for worse; it also bridges the gap that now exists between the maternity and child welfare scheme and the school medical service—a gap the results of which has brought home the truth of the oft-repeated remark of Dr. C. J. THOMAS, senior medical officer of the London County Council, that "The school service is a receiver of damaged goods."

The difficulties in the way of establishing nursery schools are numerous and real. At present the public health authority is responsible for the maternity and child welfare scheme, and although coördination between the sanitary authority and the school medical service is in most places close many financial and administrative difficulties are ready to hand. Nursery schools are essentially expensive, partly because of the cost of premises and partly because of the necessary staffing, equipment, and management, including meals. Many mothers at present object to leaving their infants at a school all day. The question whether all the helpers should be certificated teachers is much debated, and yet there must be adequate guarantee of the status of people who train children. Few of these obstacles are insurmountable and coördination is becoming more real day by day. Already in many areas pre-school children are treated at the school clinics, for school experience has shown that the heaviest burden is the disease that springs from early childhood. The money spent in rectifying early evils will ultimately lessen the heavy costs for maintenance of hospitals, sanatoriums,

clinics, and other institutions for the treatment of disease. A simple beginning could be made by extending existing welfare centres, crêches, and day nurseries, and there are many highly competent women able and willing to superintend, direct, or assist in the management of such institutions, designed in the first instance to meet the needs of the physical and social welfare of the child. Children so prepared might then attend an elementary school at an earlier age than the usual school entrant age of 5 years. At the present time the giving of school meals is largely left to the discretion of local education authorities, and practice varies widely in different localities. The question of feeding necessitous children is one for the community as a whole to solve, but confusion is apt to arise, and often does arise, from the ambiguous use of what should be specific terms. Malnutrition is a pathological condition and may be the result of many physiological and pathological conditions besides insufficient or unsuitable diet. A necessitous child is not necessarily an ill-nourished child, just as a child suffering from malnutrition is not necessarily a necessitous child. The diagnosis of the cause and the treatment of malnutrition is essentially a medical question the elucidation of which calls for much skilled knowledge. Nothing but good can come from the focusing of public attention on the health of the children; it is of paramount importance in social and national life, and its preservation and improvement forms one of our greatest medical responsibilities.

THE PROBLEM OF THE PYLORUS.

ELSEWHERE in this issue we publish the third of the Croonian Lectures lately delivered before the Royal College of Physicians by Dr. CHARLES BOLTON. Those which have already appeared [1] contain a close analysis of the symptoms complained of by a group of 1000 persons seeking relief on account of pain coming on in relation to food, and it will have been noted that Dr. BOLTON recognises three syndromes, the pyloric, the cardiac, and the œsophageal, each of which he further subdivides. The third lecture is largely devoted to a detailed examination of the factors and mechanisms and effects of pyloric dysfunction. Of late years, physicians especially interested in gastric disease have more and more subscribed to the doctrine that spasm of the pylorus and the pyloric vestibule is the main factor in the production of delayed pain after meals, and Dr. BOLTON here sets out fully the facts on which this belief is based. The movements of the pylorus are governed by the myenteric plexus, and the sphincter undoubtedly reacts to solids and to strong acids in such a way that these cannot leave the stomach until reduced to a form more acceptable to the small intestine. Being controlled by a nerve-plexus the sphincter is further liable to reflex influences such as those from a diseased appendix or colon, whilst instability of the central nervous system will also tend to cause disorderly action in this region. Perhaps, however, the most interesting part of Dr. BOLTON's lecture is the section where he discusses the influence of the pylorus as a regulator of the acidity of the gastric contents.

When investigating the case of Alexis St. Martin, BEAUMONT noted that bile was often to be found in the stomach, but it was not until BOLDYREFF demonstrated the presence of trypsin and the general regurgitation of duodenal contents in dogs that the importance of its presence was realised BOLDYREFF was the first to point out that regurgitation from the duodenum to some extent neutralises the acidity of the gastric contents, so as to secure an optimal acidity for digestion in the stomach, and so as to protect the intestine against the effects of strong hydrochloric acid. When the fractional method of gastric analysis was introduced by REHFUSS, he and his co-workers confirmed the fact that trypsin is often present in the stomach, and BENNETT and RYLE, in the well-known work in which they established the types of acidity found in normal subjects, were at pains to explain the importance of this mechanism of regurgitation in the process by which the concentration of acid falls considerably during the later stages of digestion. In 1921 GOODHART and BOLTON, by an ingenious method of studying the various chloride constituents of the stomach contents, were able to demonstrate that, as the acid curve went up, the neutral chloride curve remained low, and that, as the percentage of acid fell, that of neutral chloride increased pari passu, the total chloride curve remaining unaffected. From these and other observations they concluded that the curve which really demonstrates the secretion of acid during the fractional test-meal is not the ordinary acid curve obtained by titration, but is rather the total chloride curve; the so-called acid curve really represents the progress of neutralisation. Their results have been confirmed by BAIRD, CAMPBELL, and HERN, as well as by ROBERTS and others, and in his present lecture Dr. BOLTON gives a full résumé of the evidence together with other data which go to support the hypothesis that regurgitation of the duodenal contents is a most important factor in the normal physiology of the stomach. Among the confirmatory evidence must be mentioned the work of R. W. A. SALMOND,[2] who by careful study of barium meals, has found that 93 per cent. of normal persons exhibit some degree of antiperistalsis of the duodenum. By this process the duodenal cap is often seen to be filled under pressure not only by the stomach but also by the duodenum, and when this happens at a time of pyloric relaxation, regurgitation into the stomach occurs. Dr. BOLTON believes that in the early stage of digestion the pylorus relaxes only before gastric peristaltic waves, and that as digestion proceeds and the acidity attains its normal height, the pylorus begins to relax independently of peristalsis; if the cap is filled at this time, the duodenal contents pass back into the stomach. In a later series of observations SALMOND has introduced a different type of regurgitation which occurs during both the passive and the active phase of the cap. While the cap remains distended, and between peristaltic waves, a trickle of barium may be seen to run back into the stomach, whilst at other times a contraction of the distal end of the cap causes the regurgitation. These radiographic findings are almost impossible to demonstrate except by direct observation, but it is to be hoped that X-ray cinematography will, in time, convince all who are interested.

While accepting duodenal regurgitation as probably the most important of all factors regulating the stomach's acidity, we must admit there are other possible factors. Thus PAVLOV regarded the gastric acid as being secreted at a constant level of concentration, the apparent variation being due to dilution of the early secretion of the body of the meal and partial neutralisation by the alkaline mucous secretion of the glands of the pyloric antrum; FOSTER and others have shown that in the presence of pepsin gastric mucus can neutralise a fairly large amount of

[1] THE LANCET, June 9th, p. 1159, and June 16th, p. 1211.

[2] Ibid., 1927, i., 1230.

acid. A third possible mechanism depends on the capacity of the gastric mucosa to secrete a diluting fluid. Thus ROTH and STRAUSS showed that the concentration of salt solution in considerable quantities could be reduced in 20 minutes from 2·8 to 1·7 per cent. They found that some new fluid must have been added because sulphate and phosphate were present in the gastric contents after the operation had taken place. BENNETT and CROHN have shown how strong solutions of glucose, of acid, or alkali are similarly diluted whilst lying in the stomach. It is too early to state which, if any, of these three factors is all-important, but BOLTON and his co-workers have certainly added very considerably to our knowledge by the confirmation of BOLDYREFF'S work, so ably summarised in the lecture we publish to-day.

THE TREATMENT OF ECLAMPSIA.

THE literature of eclampsia is an unwieldy collection of conflicting views. There are probably few diseases in which the observations of reputable workers have been so vehemently denied by other workers of equal standing. The reason for such acute dissension may be that, although convulsions associated with pregnancy are known by a common name, the pathological processes leading up to the fits are not the same in all cases. No satisfactory theory of their origin has yet been formulated and the ætiology of eclampsia remains obscure. The scheme of eliminative treatment devised by Dr. HASTINGS TWEEDY has been adopted as an empirical measure by many obstetricians who do not accept the theory of toxæmia on which it is founded; similarly, the removal of sources of irritation, and the exhibition of narcotics as practised by Prof. B. STROGANOFF, has been tried with good results, though the basis of this treatment remains hypothetical. Prof. STROGANOFF holds that eclampsia is of placental origin, being the product of two factors—the toxins circulating in the maternal blood, and the irritability of the pregnant woman's nervous system. The Dublin school believe that during the metabolic processes normal to pregnancy, toxins may accumulate owing to faults in management or deficient reserve power of the excretory organs. According to them, if toxæmia in the early stages is treated by starvation and laxatives, and the patient is encouraged to drink large quantities of water, eclampsia may be prevented. In the stage of convulsions their treatment consists of drastic purgation, lavage of the stomach and colon, and the promotion of diaphoresis and diuresis. The exact ritual of this school is familiar to readers of our series of articles on Modern Technique in Treatment.[1]

Prof. STROGANOFF, who is tireless in advocating the method which has been so successful in his hands, complained, in a communication submitted on June 15th to a meeting at the Royal Society of Medicine (see p. 1281), that its details are sometimes modified with unfortunate results. The main principles of his treatment are that the patient should be kept perfectly quiet in an isolated and darkened room; morphia should be given sparingly, choral hydrate in considerable quantities. All manipulations must be carried out under chloroform anæsthesia. Most careful attention to details is, however, essential if the best results are to be obtained. When the procedure advocated by him is minutely followed, and if the patient is not in labour, he claims that the fits generally cease and the pregnancy continues without reappearance of the symptoms. Prof. STROGANOFF does, however, allow certain modifications of the improved technique set out in THE LANCET in 1924 (vol. ii., p. 62). He approves of the substitution of luminal and hedonal for chloral hydrate in certain circumstances, their advantage being that they can be administered subcutaneously, whereas the only way in which chloral can be given to an unconscious patient is per rectum, when it may not be absorbed.

That conservative methods of treatment should be preferred to Cæsarean section or accouchement forcé was the definite conclusion reached by the sub-committee of the Section of Obstetrics and Gynæcology of the Royal Society of Medicine, appointed in 1921 to investigate the matter, and this conclusion was confirmed by reports from other societies received at the British Congress of Obstetrics and Gynæcology, held at Liverpool in 1922. But as between the techniques elaborated in Dublin or in Leningrad no pronouncement was made either by the committee or at the Congress. At the meeting of the British Medical Association held at Glasgow in 1923 the discussion favoured the Dublin procedure, but this was before the publication in this country of Prof. STROGANOFF'S improved prophylactic method. This has since been tried at Queen Mary's Hospital by Mr. L. C. RIVETT, who has treated 44 cases with only three deaths. In America, where conservative methods do not appear to have been generally accepted, JOHN WHITRIDGE WILLIAMS, at the Johns Hopkins Hospital, is said to have reduced his mortality from 22·8 to 13·3 per cent. by using this method, while Prof. STROGANOFF'S own recent figures are as low as 2·6 per cent. in 300 cases. It is to obstetricians working in this country, however, that practitioners will turn for more specific advice than they have hitherto received. The disease was never so common that the practitioner could hope to test for himself the different methods of treatment, and in recent years the increased number of women receiving antenatal care has further diminished its incidence. It is the more important that guidance should be available for the medical man who sees perhaps only one case in the course of five years. Assuming that conservative treatment is desirable should he adopt the Dublin method or that of Prof. STROGANOFF? The Section of Obstetrics and Gynæcology of the Royal Society of Medicine has recently drawn up a scheme under which reports from maternity hospitals will be issued on a definite pattern. Under this scheme the results at different hospitals should be easy to ascertain, and more valuable statistics, based on larger numbers, should be collected. The exact methods now used respectively by Dublin workers and by Prof. STROGANOFF could be tried on a considerable scale if all the maternity hospitals would coöperate to this end, and we suggest that a serious attempt should be made to decide which gives the better results under comparable conditions.

[1] THE LANCET, 1923, ii., 666.

LIVERPOOL AMBULANCE SERVICE.—The Voluntary Hospitals' Council of Liverpool is considering the best means of providing an ambulance service for transporting incapacitated patients from their homes to the hospitals. The work is at present performed by the police and privately owned ambulances, but it is felt that in the interests of the outlying districts a properly equipped service under the control of the Council has become necessary.

Annotations.

"Ne quid nimis."

POST-VACCINAL ENCEPHALITIS.

THE increase in cases of acute disease of the central nervous system during the last 25 years has been a notable feature of medical records. Epidemics of cerebro-spinal fever on the Continent, in the U.S.A., and in this country, were for the first time definitely recognised, though much earlier outbreaks are known to have occurred. The serious epidemics of polio-encephalomyelitis in Scandinavia in 1905, and in the U.S.A. in 1909, and the increased prevalence of this disease in Great Britain since 1910, brought into great prominence the problem of infective disease of the central nervous system due to an invisible virus. Though no visible causal microbe could be discovered, the transmission of the disease to monkeys has repeatedly been accomplished. The appearance in 1907–8 of von Economo's epidemic encephalitis added a still more intangible element to the problem. This disease is very variable clinically and is more inscrutable in its pathology, for it has proved far more difficult to transmit to animals. The experimental problem has been further complicated and the imagination stirred by the discovery of a form of acute encephalitis communicable to rabbits by means of a virus present in the vesicles of ordinary *herpes labialis*. The serious prevalence of these diseases, especially those due to filtrable viruses, has given rise to the suggestion that some new factor in modern life predisposes to, if it does not actually originate, these obscure nervous affections, and it has been argued that a widespread carrier state or constitutional susceptibility has conditioned the occurrence of an actual attack of one or other of them when some other exciting cause has lowered resistance or produced an initial lesion in the brain or spinal cord. To this confused state of pathology has entered a fresh factor—the recognition of cases of encephalomyelitis following vaccination, usually primary vaccination in adults or children after the first or second year of life. These cases, which are now well known, have been recorded in many countries and have been the subject of comment in THE LANCET.[1] The occurrence of encephalomyelitis of similar type has also been reported after measles and chicken-pox. The disease has not been certainly communicated to animals from these cases. Attention has been called by F. Redlich[2] and others to cases described as encephalomyelitis disseminata which occur independently of recognised acute infectious disease, and only last week Dr. Donald Hunter and Dr. Russell Brain referred in our correspondence columns (THE LANCET, June 16th, p. 1250) to six cases seen recently at the London Hospital which clinically came under the heading of acute disseminated encephalomyelitis, but were in no way connected with vaccination.

As Prof. J. C. G. Ledingham points out on p. 1301 of our present issue, there is no constant clinical picture in post-vaccinal nervous disturbance; at least six clinical types of nervous disease have been reported as following vaccination. Two main hypotheses have been put forward to account for the cause and nature of these cases. The first is that they are due to vaccinia virus acting alone directly on the nervous tissues; the second, which is perhaps more generally supported, is that they are due to some other latent virus, stirred into activity by the vaccinia. This activation might be attributed either to the generalisation of the vaccinia virus and the consequent onset of symptoms about the eighth to twelfth day, a time at which a general vaccinia eruption occasionally occurs, or to an anaphylactic phenomenon akin to the fever, joint-pains and rash of serum disease, following the injection of antitoxin. Two recent communications support this latter view. F. Paul[3] records four cases in adults of *encephalomyelitis disseminata* due, he believes, to the virus of poliomyelitis; from one of these two monkeys were infected experimentally. These cases, he states, exactly resembled in every way, clinical, pathological, and histological, a post-vaccinal case which he also examined. v. Mikulowski[4] related two cases, both in infants, of post-vaccinal nervous disease. One was in a child of 13 months, whose symptoms suggested encephalitis lethargica; the onset was on the eighth day after vaccination; recovery was not complete since paresis, convulsions, and athetosis persisted. In the other case, symptoms were noticed seven days after vaccination and lasted only 48 hours, but were severe and suggested encephalitis. v. Mikulowski maintains that the symptoms and pathology of cases of post-vaccinal encephalomyelitis are often identical with those of *encephalitis lethargica*. On the other hand, such experienced investigators as H. M. Turnbull, J. M. McIntosh,[5] and J. R. Perdrau[6] agree in believing the pathological histology of the post-vaccinal cases to be different from that of poliomyelitis and encephalitis lethargica, and describe a characteristic perivascular demyelination as distinctive. Perdrau, however, considers the characteristic histological features of "disseminated encephalomyelitis" to be the same whether the disease is a sequela of vaccinia or some other acute infection or occurs independently. The importance of these cases is obvious, and it is to be hoped that the request of the Ministry of Health, published in THE LANCET of April 24th, 1926, for the notification of nervous illness within four weeks of vaccination, will lead the way to early recognition and elucidation of these obscure conditions.

[1] THE LANCET, 1925, ii., 1239; 1926, ii., 509, 764; and 1927, i., 619. [2] Wien. klin. Woch., 1928, xli., 177.

[3] Paul, F.: Med. Klinik, 1928, xxiv., 732 and 773.
[4] Mikulowski, V.: Schweiz. med. Woch., 1928, No. 20, 506.
[5] See THE LANCET, May 26th, 1928, p. 1094.
[6] THE LANCET, June 9th, 1928, p. 1201.

PRESERVATIVES IN FOOD.

A SUPPLEMENT to the March number of the *Bulletin* of the Office International d'Hygiène Publique contains replies to a questionaire on the regulations in force in 18 countries, large and small, concerning the use of certain antiseptics in foods. Germany is the most important State unrepresented in the list. The answers suggest that there is a closer approximation in practice between different countries now than there was a few years ago. We find a fairly general prohibition of certain antiseptics and a limited use of certain other preservatives, often limited to certain specified foods; for the most part the same preservatives are allowed in the same foods. Almost everywhere there is total prohibition of formaldehyde, and its use is specifically forbidden in all foods in England and Wales, Australia, Bulgaria, Canada, the United States of America, France, New Zealand, Sweden, and Switzerland. In the reply of no country is it mentioned as being allowed. Fluoric acid and its derivatives are almost as widely banned. Boric acid and its compounds may not be used as food preservatives in England and Wales, Bulgaria, or the United States, but elsewhere their employment is permitted within specified limits—e.g., in butter, condensed milk, margarine, and cream. In Canada, for example, boric acid is permitted (1 in 400) in cream, and (1 in 200) in butter, while in France it is allowed up to 5 g. per kg. in butter and margarine. Salicylic acid and its salts are given a slightly more extended use than boric acid, although they are entirely forbidden in England and Wales, Bulgaria, the United States, and France. In many other countries they are allowed in certain foods in restricted amounts. In Canada the limit is 1 part in 5000, while there seems to be no restriction as to any particular foods; in New Zealand they are allowed in sauces, fruit juice, and non-alcoholic drinks. Benzoic acid and sulphurous acid are the preservatives most widely sanctioned.

In England and Wales they are the sole preservatives whose use is authorised, but they may be added only to certain forms of food and only up to definite limits. The practice seems to be similar in most other countries except France, where benzoic acid and benzoates are not allowed at all. The regulations about colouring matter are even more complicated and varied and show marked differences. It is, however, generally recognised that every State must regulate the use of antiseptics and colouring matter in foods, that some of these additions are entirely undesirable and unnecessary, that certain foods do require, if they are to be kept, small quantities of preservatives, and that except for special foods like butter and cream the least objectionable antiseptics are benzoic and sulphurous acids.

BIOCHEMISTRY AND MEDICINE.

THE completion of the Courtauld Biochemical Institute at the Middlesex Hospital, which was described in our columns last week, symbolises the profound change which has come over medicine in the course of this century. As Sir Archibald Garrod pointed out when opening the Institute, the science of biochemistry was represented in medicine 50 years ago by a rack of test-tubes and a few bottles in the doctor's surgery. To-day a chain of laboratories is ready to assist the practitioner in diagnosis, treatment, and even in prognosis. His patients have the benefit of a wealth of scientific technique undreamt of by the last generation, and the family doctor fights disease not as an individual but as a member of an army with a vast organisation at his back. The science of biochemistry is comparatively new. A couple of decades ago its very name was unfamiliar, though the activities of the pathologist were already known to be expanding in chemical as well as in bacteriological directions. Now the field of biochemistry as applied to medicine is so vast that there are few diseases or disorders of function whose elucidation owes nothing to biochemical methods; moreover, some of our most effective remedies have been discovered, tested and standardised by laboratory workers. The new science plays an important part in preventive medicine, for it has evolved a multitude of tests by which the efficiency of the various bodily functions and the integrity of the various organs may be estimated, and from the results of which an accurate index of a normal man's health can be obtained. Its potentialities in this direction will be of progressive interest to actuaries. In forensic medicine the assistance of biochemistry has already proved invaluable. As to clinical medicine, the outlook in such serious diseases as cretinism and diabetes has been completely altered. With the isolation of the active principles of the ductless glands, their standardisation, and their synthetic preparation, an entirely new chapter of controlled therapeutics has been opened. On the diagnostic side the estimation of the functional activity of the stomach, kidney, and liver are of increasing importance; while changes in the chemistry of the blood and cerebrospinal fluid are being gradually but surely correlated with clinical syndromes. The colloidal chemistry of the body proteins is still in its infancy, but already light has been thrown on metabolic processes and great advances may be expected in the future.

But the hopes aroused by the development of a new science ancillary to medicine may be disappointed in two ways. The specialists who devote their life to its pursuit may lose sight of the clinical application of their knowledge, and become engrossed in theoretical studies; on the other hand, clinicians who have received less help than they anticipated from the laboratory in diagnosis and treatment may be reluctant to give adequate trial to new and complicated tests which make no claim to do more than confirm or throw doubt on clinical findings. When, however, an institute of biochemistry is situated not in academic isolation but actually in the same building as a large hospital, there must be such intimate association between laboratory and clinical workers as will ensure a constant interchange of ideas and problems. Prof. E. C. Dodds has already shown how keen and how stable is his interest in clinical problems, and workers under his direction will not fail to keep in touch with the needs of the patient. We congratulate the Middlesex Hospital on its good fortune in possessing a biochemical staff whose direct contributions to medicine are so impressive that Mr. S. A. Courtauld has already added to his munificent gift the sum of £20,000 towards the maintenance of the Institute.

OPERATIVE TREATMENT OF UTERINE CANCER.

THE chief gynæcological subject chosen for discussion at the meeting of the Nordisk Kirurgisk Forening in Gotteborg last summer was the comparative value of radiotherapy and operation in the treatment of cancer of the uterus. Dr. G. Schaanning, who dealt with the surgical aspect of the problem, has published a summary of his paper in the *Tidsskrift for Den Norske Laegeforening* for June 1st, 1928. As a former assistant of Prof. K. Brandt, he has been able to use the material of the University Gynæcological Hospital in Oslo. The period covered is from 1906 to 1925, and the number of cases of cancer of the uterus treated during this period was 562, of which 508 were cancer of the cervix, while the remaining 54 were cancer of the body of the uterus. Thanks to the comparatively stationary and controllable character of the population, Dr. Schaanning was able to trace as many as 537 of the patients. Of the 508 patients suffering from cancer of the cervix, 287 underwent some sort of operation, and 226 had a radical operation. The operative mortality of the radical operations was 10·6 per cent., but varied greatly, as might be expected, with the extent of the disease, being as low as 7·3 per cent. in early cases, and as high as 15·7 per cent. in advanced cases. What was, however, more striking and instructive was the reduction in the operative mortality during the period under review, although no fundamental change was made in the indications for operation during this period. Thus, in the five-year period, 1906–10, the operative mortality was 21·4 per cent., whereas during the period 1916–25, it was only 5·6 per cent. It is a pity that information is not forthcoming in this paper to explain such a remarkable improvement. The ultimate results were judged by the proportion of survivals without recurrence of the disease after an interval of at least five years, and it seems that only 26·7 per cent. of all the women who underwent a radical operation for cancer of the cervix could pass this test. Even when only those cases were considered in which there was no infiltration of the glands at the time of operation, the proportion of patients living without a recurrence of the disease five years or more after the operation was only 33·8 per cent. These figures give force to Dr. Schaanning's plea for an educational campaign to increase the possibilities of an early diagnosis. Such a continuous campaign is, in his opinion, the measure which is most likely to improve the prognosis. It will be interesting to note to what extent this opinion is endorsed at the forthcoming international conference on cancer.

STREPTOCOCCUS CARDIO-ARTHRITIDIS.

THE elective localisation of certain bacteria is well established; no one doubts that the bacillus of typhoid fever, however administered, is eventually localised in the small intestine. The work of Rosenow, particularly on the streptococci, certainly points to an elective localisation of these organisms. For example, 50 per cent. of the animals inoculated with a streptococcus from a cardiac valve acquired lesions in the cardiac valves; a strain from a case of chronic arthritis gave 66 per cent. lesions in the joints.[1] It

[1] Newer Knowledge of Bacteriology and Immunology. Jordan and Falk, 1928, p. 576.

is only a step from this to the theory of specificity among the streptococci, and in rheumatism we are familiar with the organisms of Beattie, Poynton and Payne, and Birkhaug. All observers agree, however, that most cases of rheumatism do not yield organisms either from the blood or in local lesions, and none of these has yet been recognised as the specific cause. The latest claimant is the "Streptococcus cardio-arthritidis" of J. C. Small, which has lately attracted some attention. Its claims, as now set out,[2] are difficult to appraise. Only three of Small's strains come from the blood; most of them are from the throat, where streptococci abound; and no evidence of any normal controls is given. Though the organism is said to be non-hæmolytic, to vary in its sugar reactions, and to be specific in its agglutinations, no cultural characteristics are adduced which would make it possible to recognise the strains. Many of the references are "in the press," others are "personal communications," and on the whole, technical details are inadequately presented. It may be noted that tests of cutaneous sensitiveness are on the whole negative, which is remarkable, since other workers have recently claimed specific results with their strains and, in fact, a surprisingly large number of rheumatic patients are Dick-positive. The author's parsimony in bacteriological information, however, is balanced by his generosity in clinical detail. Patients are treated by vaccines, by "soluble antigen," made by washing the streptococcus, and by antisera, and especially by concentrated globulin precipitates. Striking results are claimed; very exact and ample clinical details are quoted. Opsonic indices and agglutination titres show a speedy upward change; chorea disappears; valvular lesions are ameliorated. In considering these reports it should be remembered that a relatively new claim to the identification of the causal organism of rheumatic fever lends itself to criticism. Many independent investigators have incriminated the streptococcus, whereas few have produced evidence to show that other organisms might be to blame; but even if its guilt be proved the question would remain, whether one strain of streptococcus is specific for the disease or whether a variety of strains may cause it. The trend of opinion all over the world appears to favour a fresh trial of streptococcal antisera for many diseases whose ætiology is not as yet completely understood.

INDUSTRIAL ACTIVITY AND FATIGUE.

THE history of human endeavour in the past, whether in the construction of pyramids, cathedrals, industrial works, or engineering plants, has too often been a tale of effort forcefully directed by task-masters with but little care for the well-being of the labourer so long as the task progressed. Not until the beginning of this century did it begin to dawn upon employers, as a class, that maximum production is contingent on the fitness of the worker. In the eighth annual report[3] of the Industrial Fatigue Board an account is given of the way in which the work of the Board started and has since progressed, and of the gradual expansion of its activities. The problems recently submitted to the Board for solution cover a wide field and are of considerable importance. They include hours of work in relation to the value of rest pauses during long spells, and to the double-shift system for women; the physiology of ventilation with special regard to heating by the panel system; vision and lighting; accident causation; vocational guidance, and other matters. Government departments and industrial associations have sought information as to mining conditions, telegraphists' cramp, weight-carrying, and sickness in the cotton industry and printing trade. A further line of activity has been concerned with research into the principles governing muscular activity, muscular effort, and the effects of noise and vibration. Laboratory research often helps to disentangle the host of interfering factors which confuse the issue in industrial practice. Evidence, at first inconclusive, has been reinforced from different sources—for example, the increase in rate of output on short shifts, the beneficial influence of short rest pauses, the importance of high illumination in fine processes, the deleterious effects of high temperatures on work involving muscular effort, are among the conclusions which were tentatively made at first and as the result of many investigations, gradually came to be accepted. The Board is steadily gathering and propagating new knowledge, and even more important, is showing that improved conditions of work are beneficial alike to employers and workers.

[2] Amer. Jour. Med. Sci., 1928, clxxv., 638.
[3] Eighth Annual Report of the Industrial Fatigue Research Board, to Dec. 31st, 1927. H.M.S.O., 1928.

STEEL DENTURES.

DURING the late war the shortage of rubber and precious metals in Germany affected, among others, the dental profession, since the construction of dentures involves either a vulcanised rubber or a gold base. As a substitute for these materials the firm of Krupp began to experiment with stainless steel as a denture base. The method soon passed beyond the experimental stage, and before the end of the war dentures of stainless steel were being made on a considerable scale. Even now that both rubber and gold are freely procurable, steel is still being used in Germany to some extent, apparently with satisfactory results. In England experiments have been chiefly directed towards finding a synthetic resin which could be coloured to resemble gum more closely than is possible with vulcanite, and these attempts have been so far successful that it is hoped that vulcanite may soon become obsolete. The German investigations have, however, stimulated some preliminary trials of steel in this country, and Mr. A. C. Hutchinson, in the *British Dental Journal* for May 15th, records some experiments carried out in the Manchester Dental Hospital with the coöperation of Messrs. Firth and Sons, of Sheffield. It appears that Krupp's use for dentures a rust-proof steel belonging to what is termed the VA group, which has a high resistance to corrosion even when soft. It contains 20 per cent. of chromium and a medium content of nickel. A denture made of this material is only half the weight of a gold plate of the same thickness, and in order to ensure equal strength the gold denture would have to be twice as thick, and would weigh four times as much. Mr. Hutchinson experimented with Firth's Staybrite silver steel and found it possible to hammer and swage the material into dental plates. Soldering, on the other hand, presented great difficulties and, so far, the search for a suitable flux has not been wholly successful; but it was found possible to attach teeth to a steel plate by means of vulcanite, and the attachment appeared perfect. The work is still in the experimental stage in this country, and the production of dentures which are satisfactory in the mouth is still some way off, though there seems to be no reason why the German results should not be repeated here. We understand that in Germany the process is complex, involving a technique not possible in a dental workshop, and that the actual swaging of the steel is carried out by Krupp's to models supplied by dentists. Nevertheless the method has distinct possibilities and we hope that Mr. Hutchinson will continue so promising an experiment.

SPASM OF THE PYLORUS IN INFANTS.

ONE effect of the introduction of Rammstedt's operation for hypertrophic stenosis of the pylorus in infants has been that a distinction is drawn between cases in which there is a palpable pyloric tumour and those in which there is not. With an experienced and careful observer it is safe to say that if a tumour cannot be felt after several examinations, and visible gastric peristalsis is well marked, the case is probably one of pyloric spasm, for which operation is contra-

indicated. The distinction between the two types of cases has led to a closer study of the ætiology of these conditions, and Dr. M. I. Rubin [1] now calls attention to the presence of an enlarged thymus in cases of pylorospasm. He has observed that in suspected pyloric stenosis the vomiting often stops after an examination with X rays. He has also found that in these cases there is commonly a history of attacks of breath-holding and cyanosis which point to the possibility of thymic enlargement. Radiograms were taken with this in view and in 13 unselected consecutive cases an enlarged thymus was seen, whereas the gland was enlarged in only one of seven cases of true pyloric stenosis. More than half of the cases of pylorospasm had symptoms suggestive of thymic enlargement, and the five which were treated only by exposure of the thymic region to X rays all showed improvement. Other observers have called attention to the possible association of enlargement of the thymus with pyloric spasm, and treatment by means of X rays or radium has also been previously reported. At the same time, as Dr. Rubin points out, it is still doubtful whether the respiratory embarrassment in these cases is really referable to an enlarged thymus, and the value of radiological examinations, more especially when negative, is not fully established. In one series of 60 infants with varying complaints X rays showed enlargement of the thymus in 29, which suggests that deductions about the connexion between thymic enlargement and pylorospasm are of uncertain value if based solely on radiological examination. A larger series of infants with pylorospasm will have to be examined and treated by X rays before such a connexion is placed beyond doubt.

THE WORK OF A POOR-LAW HOSPITAL.

Dr. A. Lionel Baly, the medical officer of the Lambeth Poor-Law Hospital, has combined with his report for last year a retrospect of the work of the institution during his 20 years' service. It is an outspoken and challenging document which not only records the progress of the last two decades but indicts boards of guardians generally for having "completely failed to appreciate their responsibilities" under the existing law, with the result that "the poor-law hospital has not been provided with adequate facilities for the treatment of patients." Had they risen to their responsibilities Dr. Baly believes that there would have been no waiting lists at the voluntary hospitals, since destitute patients would have been taken off those lists, and that consequently the question of poor-law reform would not have arisen. Even now he is satisfied that the adoption of enlarged facilities would be infinitely less costly than any of the suggested reforms. But, apart from the slow growth of the ideal that a "workhouse infirmary" should afford its patients the best that science can give, boards of guardians generally would probably reply that they have been compelled to keep the fear of the ratepayers before their eyes. In any case the opportunity—if, in the comparatively recent state of public opinion, it was an opportunity—has been lost, and poor-law reform in a more or less drastic shape is now bound to come.

That the poor-law hospitals have grown enormously in importance and efficiency of late years is well known, and the figures which Dr. Baly gives of his own experience are convincing, since it is certain that many similar institutions could, mutatis mutandis, show parallel results. Between 1912 and 1927 the number of patients dealt with at the Lambeth Hospital has increased by 80 per cent., the accidents and injuries treated by 390 per cent., and the number of operations by 592 per cent. Serious cases, as of fracture and concussion, have risen enormously, yet it is significant of the efficiency of modern methods of surgery that the deaths have increased by only 37 per cent. With the exception of the dental department practically all the new departments have been added since 1912. All this leads Dr. Baly to point out not only that the work of a first-rate poor-law institution is now that of a large general hospital, but that the poor-law institutions are the only "general" hospitals into which all classes of cases, with the exception of a few specified fevers, have to be admitted. This being so, it is obvious that for the proper classification and separation of the more serious cases from the general wards a poor-law hospital ought to be as well equipped as a voluntary one, if not better. The present mixtures of serious or dying cases with convalescent patients will, all will allow, be looked upon in the future as incredible. Dr. Baly calculates that the amount of scientific work now being done by the London poor-law hospitals is approaching that of the voluntary institutions, and that they will in time be forced to undertake a far greater proportion of it unless the hospitals outside the poor-law are enabled to increase their resources enormously.

On the difficult matter of the certification of mental cases Dr. Baly has some interesting things to say. Since he has at his disposal no suitable accommodation for mental cases he has to certify all of them, notwithstanding the almost daily pleas of the relatives of these unfortunate patients that they should be allowed to remain where they are instead of being removed elsewhere as "insane." He is fully convinced that with proper accommodation he could keep at least 25 per cent. of these patients in general wards without certification. It is fully open to boards of guardians to provide this accommodation, though it means that in London the cost would be transferred from the County Council to the union. An alteration of the law would, however, be necessary for the retention, which Dr. Baly strongly advocates, of recoverable certified cases within the walls of poor-law hospitals. This is a direction in which elasticity is needed alike for scientific reasons and as a concession to the entirely comprehensive human repugnance to the indiscriminate use of the word "insane."

THE BUNDABERG DISASTER.

IT will be recalled that a Commission was appointed to inquire into the deaths which in January followed the injection of diphtheria prophylactic into a number of children at Bundaberg, in Queensland, Australia.[1] The Canberra correspondent of the *Times* last week telegraphed particulars of the Commission's report, now tabled by Sir Neville Howse, the Federal Minister of Health. The evidence given before the Commission subsequent to our comment on Feb. 4th suggested bacteriological contamination as the cause of the accident. The prophylactic toxin-antitoxin mixture used contained an amount of nutrient broth which would, in the absence of an antiseptic, act as a good medium for the growth of any organisms fortuitously introduced. The doctor who made the injections testified that the prophylactic was observed to be cloudy on inspection the day after the injections, when the first children died. Curiously enough, the prophylactic contained no antiseptic, a point which the Commission adversely criticises, remarking that such products, unless containing sufficient antiseptic, should not be issued in rubber-capped containers for repeated use. So far as we are aware, all prophylactics and vaccines issued in rubber-capped bottles in England, America, and Germany contain from 0·3 per cent. to 0·5 per cent. of phenol, tricresol, or lysol, an amount sufficient to inhibit the growth of practically all pathogenic organisms. Though rubber-capped bottles have been much used as containers, most heads of laboratories issuing sera and vaccines dislike them. When fluid is withdrawn through a syringe needle which has been plunged through the cap, a partial pressure is produced inside and at the first opportunity air with any contamination on the cap is sucked in. Though it is possible for a trained bacteriologist repeatedly to pierce the cap of a rubber-capped bottle containing only sterile nutrient broth, without causing contamination, the risk in practice is

[1] Jour. Amer. Med. Assoc., May 26th, p. 1694.

[1] See THE LANCET, Feb. 4th, p. 249.

a real one, and there is evidence that bottles in the past have been contaminated in this way even when containing a reasonable amount of antiseptic. For sterilising the cap before puncture pure lysol or tincture of iodine is usually employed. The Commission concludes that staphylococci had been introduced by the needle through the rubber cap when the bottle was in use some days before the fatal day late in January, and that these organisms caused the deaths. These conclusions are said to rest partly on negative evidence. From the evidence given before the Commission and reported in the Australian press we know that the first symptoms of illness in the children who had been injected were vomiting, diarrhœa, and fever, coming on within eight hours. There is no mention of any organism of the food poisoning group. The symptoms described are not those usually caused by streptococci or other dangerous microbes which might suggest themselves, nor are they the commonly accepted symptoms of illness caused by staphylococci, though we must admit that we do not know much of what would happen after the injection subcutaneously or intramuscularly of the enormous numbers of cocci that might be contained in a fluid recognisable as "cloudy." The Commission apparently recommended consideration of the use of detoxicated toxin—i.e., toxoid or "anatoxine." (The cable, presumably in error, reads "antitoxin.") We have previously noted [1] that the prophylactic mixture mostly used in England contains toxoid and no untreated toxin. Toxoid alone is being used tentatively in England and by Park and others in U.S.A., and is widely employed in French-speaking parts of Europe.

The whole incident reaffirms that the price of safety in these matters is eternal vigilance, but it does not indicate any loophole in the regulations or prevalent practice in English-speaking countries, with which we are most concerned.

CONGENITAL ANEURYSM OF THE CEREBRAL ARTERIES.

SPONTANEOUS subarachnoid hæmorrhage of non-traumatic origin, of which Dr. Bruce Maclean reports a case in our present issue, has proved of great interest both to clinician and pathologist since 1859, when Sir Samuel Wilks published a paper entitled Sanguineous Meningeal Effusion (Apoplexy): Spontaneous and from Injury. As the result of his work rupture of saccular aneurysms upon branches of the circle of Willis slowly came to be recognised. H. Eppinger, in 1887, was the first to postulate a congenital basis for these aneurysms, and he demonstrated localised defects in the elastic and muscular elements of the vessel wall. He pointed out that they almost always occur at the bifurcation or branching-point of vessels and generally in the fork between the parent trunk and the origin of a branch. In this country H. M. Turnbull (1914) and E. G. Fearnsides (1916) have fully confirmed what Eppinger said. Turnbull describes the lesion as "an inherent weakness due to a congenital abnormality in the structure of the arteries at their points of junction." They established the observation, since confirmed by others, that such aneurysms may be met with at all ages from early infancy upwards and may in fact rupture at any age.

Recently the co-existence of co-arctation of the aorta and ruptured cerebral aneurysm has been recorded by several independent observers—H. L. Parker (1926), F. Parkes Weber (1927), H. W. Woltman and W. D. Shelden (1927), and F. H. K. Green.[1] This last author points out that these observations support the hypothesis of Eppinger, for "where one congenital abnormality exists it is by no means uncommon to find others." He adds that "against this may be objected the fact that in patients with aortic co-arctation it is common to find an abnormally high blood pressure in the vessels to the head, neck, and upper extremities, and this in itself might be adduced to account for the formation of aneurysms in the brain."

It is important to remember that a large proportion of all cerebral aneurysms produce no symptoms during life. A considerable number press upon or rupture into the brain, giving rise to symptoms and signs which are indistinguishable from cerebral tumour or from cerebral hæmorrhage. There is, however, one clinical picture which we owe principally to C. P. Symonds (1923), in which the aneurysm ruptures minutely and leaks slowly into the subarachnoid space. The leakage may be so gradual as to cause little or no cerebral compression, so that consciousness may not be lost. Signs of acute meningeal irritation appear—headache, pain or stiffness in the neck and limbs, a positive Kernig sign, and a dazed, irritable mental condition. The occurrence of "hæmatolytic" fever in the first ten days may give rise to suspicion of an infective meningitis, but lumbar puncture reveals a cerebro-spinal fluid which is highly characteristic (Froin, 1904). There is: (1) An even admixture of blood which is the same in a series of specimens collected at the same puncture; (2) absence of coagulum; and (3) pink, brown, or yellow colouration of the clear supernatant fluid, which is apparent when the red cells have been allowed to sink to the bottom of the tube.

The occasional occurrence of subretinal and vitreous hæmorrhages is another phenomenon of great importance. The earliest case recorded is that of Sir William Hale-White (1895). C. P. Symonds (1923), L. Paton (1924) and G. Riddoch, C. B. Goulden, and H. M. Turnbull (1924) have since discussed their ætiology and significance. The hæmorrhages result from venous obstruction due to distension with blood of the subarachnoid sheath of the optic nerve. As might be expected, they are particularly found in those cases where the ruptured aneurysm is of the anterior cerebral, anterior communicating, or internal carotid arteries. The question whether the subarachnoid hæmorrhage itself ever penetrates the lamina cribrosa still gives rise to dispute.

[1] Green, F. H. K.: Quart. Jour. Med., 1927–28, xxi., 419.

SUBSCRIBERS to the Dawson Williams Memorial are invited to attend a meeting to be held at the House of the Royal Society of Medicine, 1, Wimpole-street, W., on Tuesday, July 10th, at 5.30 P.M., to receive the treasurer's report and decide on the form of the memorial. The organising committee suggests that it should be a prize, to be awarded every two or more years, for the best work which has been done in pædiatrics since the previous award. The list of subscribers will remain open until July 10th, and contributors are invited to send their cheques to the hon. treasurer, Sir StClair Thomson, at 61, Wimpole-street, W. 1, before that date, as the list must be then finally closed.

THE eighteenth annual meeting of the Oxford Ophthalmological Congress will be held from Thursday, July 5th, to Saturday, the 7th, under the mastership of Mr. Philip Adams. The Doyne Memorial Lecture will this year be delivered by Dr. Arthur Thomson, the Dr. Lees professor of human anatomy in the University of Oxford, whose subject will be Observations on the Eyes of Birds. The full programme of the congress may be had from the hon. treasurer, Mr. Bernard Cridland, Salisbury House, Wolverhampton. An exhibition of ophthalmological instruments and apparatus will be on view during the meeting.

WE regret to record the death on June 16th of Lord Hambleden, chairman of King's College Hospital, to whose generosity this hospital owes not only its present site but many other benefactions. Lord Hambleden was a firm friend to the voluntary hospitals and a powerful worker in their interests. The institution of the Hospital Saving Association, over which he presided, and recently the development of the principle of admitting paying patients to private wards, owe much to his initiative, and his wise counsel will be greatly missed by those concerned with the welfare of the sick.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CCLXXXI.—THE TREATMENT OF TIC
(HABIT SPASM).

A TIC may be defined as "a coördinated purposive act, provoked in the first instance by some external cause or by an idea" and perpetuated as a repetitive involuntary movement. The same term has recently also been applied to certain coördinated involuntary movements which are found in persons suffering from organic diseases of the nervous system—for example, epidemic encephalitis. In spite of superficial similarities these two forms of involuntary movement are ætiologically as distinct as the hemiplegia produced by hysteria and that resulting from cerebral hæmorrhage, and the word tic is employed in this article in its older and established usage of a derangement of neural function occurring in the absence of organic nervous disease. Involuntary movements of organic origin which may be confused with tic include some of the very varied disorders of motility which may follow epidemic encephalitis, especially the so-called postencephalitic "tics," myoclonic movements, conjugate ocular spasms, and the slow rhythmical movements known as bradykinesias. Other conditions which must be considered in making the diagnosis include muscular spasm due to focal epilepsy, and extrapyramidal syndromes such as chorea, athetosis, and torsion spasm.

Ætiology.

Experience has shown the following working hypothesis to be of practical value in treatment:—

There is much to be said for regarding a tic as a conditioned reflex—that is, as a motor response which through a process of association has come to be linked with an inappropriate stimulus. At first the movement which later becomes a tic is purposive, being still the response to an appropriate stimulus. For example, a child blinks because it has conjunctivitis or twists its head because its collar is tight. Why does the movement continue after the stimulus has ceased to exist? The explanation is that the movement has now become the motor response to a new stimulus which has become capable of evoking it through association with the original one and which continues to be operative though the latter has come to an end. This association is a mental process which relates the movement to new elements in the patient's environment. For example, a child's innocent and physiologically justifiable sniff or wriggle may evoke admonitions or punishment from its father or the irritated protest of its mother that "it gets on her nerves." The movement may thus become associated in the child with mixed feelings of fear, resentment, and a sense of its power to exasperate, all of which are directed towards the parent. The parent's reproof and the child's emotional reaction to it become linked with the original stimulus and acquire the power to elicit the same response. Thus the parental eye becomes a conditioned stimulus which now by itself is capable of evoking the movement. Later the movement may be called forth by any circumstances which produce in the child the corresponding state of mind, especially by anyone who stands to the child in a relationship somewhat similar to that of the parent—for example, the school-teacher. Suggestion also plays an important rôle in strengthening and establishing the pathological reaction, often operating in the well-meaning comments of relations or neighbours that "the poor child can't help it." Once established, the tic tends to strengthen in the patient, who is powerless to control it, those very feelings of inadequacy or self-pity which are usually associated with its evocation, and so to set up a vicious circle.

One more ætiological factor remains to be mentioned. The tic as a link in a causal chain is related not only to the past but to the future, and has reactions which reverberate indefinitely between the patient and his environment. He is apt to exploit his disorder as a defence against the very circumstances which elicited it, using it perhaps as a scourge to a repressive parent, a claim upon the pity of friends or a refuge from social obligations.

Psychotherapy.

The foregoing considerations lead us to the conclusion that no treatment of tic is likely to be successful which is not primarily psychotherapeutic. A lengthy analytic investigation designed to expose the patient's faulty emotional adjustments and to re-educate him is at present limited to the few, but fortunately much can be done without prolonged investigation, especially in early cases, by those conversant with the principles involved. Such short cuts may be theoretically unjustifiable but they have the double pragmatic sanction of necessity and success. The practitioner should recognise that the movements are a symptom of a faulty mental adjustment, and should endeavour to find an answer to the following three questions: (1) What is the stimulus—i.e., the factor in the patient's environment, which evokes the movement? (2) What is the emotional state with which it is associated? (3) What psychological end does the disability serve? Inquiry along these lines, if conducted with sympathy and tact, may lay bare feelings of inadequacy, embarrassment or shame which go the root of the symptom and indicate the lines along which the readjustment of the individual must take place.

Conscious Re-education.

Conscious re-education consists of the practice by the patient of exercises involving: (1) muscular relaxation and immobility, and (2) orderly movement of the affected parts of the musculature. The physiological basis of this mode of treatment probably consists in the fact that both voluntary relaxation and orderly movement of affected muscles involve at the level of the cerebral cortex inhibition of the pathological conditioned reflex which constitutes the tic.

1. For the practice of muscular relaxation the patient should be placed in the position in which the tic is least troublesome, which will usually be lying down. He is first instructed to practise a general relaxation of all his muscles, and later his attention is directed to the affected part of the body and he practises immobility of the affected muscles for periods of gradually increasing length.

2. He next practises exercises which involve orderly movement of the affected part, and which can easily be devised to meet the requirements of each case. Thus a patient suffering from a blinking tic is made to open and close the eyes slowly to order. Tics involving the lower part of the face are treated by opening and closing the mouth, protruding and withdrawing the tongue, retracting and pursing the lips, &c. Spasmodic torticollis requires movements of rotation and flexion of the neck. These re-educative exercises are first carried out under the supervision of the physician and the patient is then instructed to practise them alone several times a day in front of a mirror. A child naturally requires adult supervision for this purpose. Reading aloud is a useful exercise for patients with any form of facial tic, also Swedish remedial exercises. No exercises should be carried to the point of fatigue.

Hypnotic Suggestion and Re-education.

The usefulness of suggestion in treatment is limited by the fact that it does little to correct the patient's mental maladjustment. When used alone, therefore, suggestion is unlikely to produce a permanent cure, at least in adults, though it may afford striking temporary relief. The most effective way of employing it is in the hypnotic state. The patient is hypnotised and often, until the process becomes familiar to him, he exhibits an intensification of his involuntary movements during the early stages. The first suggestion given is of complete muscular relaxation and cessation of the movements. As soon as this is achieved the patient's attention is directed to the fact that he has succeeded in controlling the tic. At the first two or three treatments it is wise to be content with reaching this point and concluding with general suggestions of recovery. The next step is to begin hypnotic re-education, which consists in causing the hypnotised patient to carry out the re-educative exercises which have been described in the previous section, at the same time emphasising to him his capacity to do this successfully. By means of hypnotic suggestion the process of re-education may be shortened and the rapid improve-

ment of which the patient is conscious during his waking life is of considerable psychological value.

Direct suggestions of improvement made to the fully conscious patient are of less therapeutic value except perhaps in children, but indirectly suggestion assists the curative powers of other measures.

Surgical Treatment.

Apart from theoretical objections to the surgical treatment of tic there are few tics in the treatment of which surgical measures are practicable, and spasmodic torticollis is now almost the only one which brings the patient into the surgeon's hands. Surgery can at best be only palliative and cannot hope to achieve a radical cure; moreover, since tic is a disorder of movement and not of individual muscles, it is insufficient to put out of action only the muscles which have hitherto been involved. As J. M. T. Finney and W. Hughson say, "not infrequently, when one muscle or group of muscles—those primarily involved—are put out of commission by the operation, the affection immediately manifests itself in an adjacent set of muscles or may even involve the opposite side." However, if the operation carried out is sufficiently extensive to immobilise the affected part the suggestion of cure may be so strong that the movements do not recur when function returns.

Many surgical measures have been employed in spasmodic torticollis since Minnius, in 1641, first treated the condition by open section of the sterno-mastoid. The greatest prospect of success would appear to be offered by the operation practised by Finney and Hughson which involves bilateral resection of the spinal accessory, suboccipital, great occipital, and third cervical nerves, and which they claim yielded complete cure in 12 and improvement in a further 16 out of 32 patients operated upon. Operations for the relief of facial tic cannot be recommended.

Other Therapeutic Measures.

All available means should be employed to maintain the general health at a high level, since tics are always more troublesome when the patient is fatigued or "run down." Sedative drugs are useful adjuvants to other modes of treatment. The bromides are of help both in children and adults, and possess the physiological justification that Pavlov has shown that they strengthen the inhibitory processes of the cerebral cortex. Adequate sleep must be ensured to the patient, if necessary by the exhibition of soporific drugs. Bromides are usually sufficient for this purpose in childhood, but adults may require medinal grs. 7½, or luminal gr. 1 at bedtime. Nothing is to be expected of massage, electricity, or orthopædic appliances. In the rare cases in which the original stimulus to the movement is still present when the patient comes under observation, it will require appropriate treatment. Conjunctivitis, refractive errors, dental caries, enlarged tonsils and adenoids may thus need to be dealt with.

Special Points in Children.—The whole household must unite in a conspiracy to take no notice of the child's movements, except as may be necessary to carry out the prescribed treatment, and all forms of punishment and reproof must be prohibited. If no improvement results the child should be sent to relatives in another town for a time, or admitted to a suitable hospital. In some children an attack of chorea appears to form the starting-point for tics; this sequel is to be avoided by thorough treatment and prolonged convalescence after the attack. Imitative tics are especially prone to occur in children, and the presence of a near relative suffering from a similar disorder is a strong reason for treating the child away from home. Lastly, it is impossible to over-stress the importance of early treatment since tic in childhood is eminently curable, while in adults it is apt to be one of the most intractable of functional nervous disorders.

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Special Articles.

MEDICINE AND THE LAW.

Dangerous Drugs Act Prosecution Fails.

ON June 4th, after taking time to consider his judgment, Mr. Gill, the Westminster magistrate, dismissed a summons against Mr. Robert Lee Dillon, who was charged with obtaining morphine with prescriptions supplied simultaneously from two doctors without disclosure to either doctor that he was being treated by the other. It is a pity that the law on matters of this kind should be contained in departmental regulations and not in the direct legislation of Parliament itself; and, indeed, the position is not so clear but that it may be well to remind practitioners of how the matter stands. In 1921, Regulation 7 of the Regulations of May 20th declared that "no person shall be in possession of any of the drugs" (i.e., morphine, cocaine, &c.) "unless . . . he proves that the drug was supplied for his use by a duly qualified medical practitioner or registered veterinary surgeon or on and in accordance with such a prescription as aforesaid." In October, 1922, a fresh set of Regulations added the words "or attempt to obtain possession of," after the words "No person shall be in possession of." Finally, in 1926, after the report of the Departmental Committee on Morphine and Heroin Addiction had been published and considered, a further paragraph was added at the end of Regulation 7, as follows:—

"Provided that the last foregoing provision shall not apply to any drug supplied to a person for his use by a medical practitioner or in accordance with a prescription if that person was at the time of the supply in course of receiving treatment from another medical practitioner in respect of addition to any of the drugs or otherwise, and of being supplied with any of the drugs by or on a prescription given by that last-mentioned practitioner, and did not disclose that fact to the first-mentioned practitioner before the drug was supplied to him."

In framing the law on these lines the Home Office rejected a suggestion to make it obligatory upon doctors to notify to the Home Office any case in which a person is being treated by the continuous administration of morphine or heroin. It was realised that notification would help the Home Office to detect cases where patients were obtaining supplies concurrently from two or more doctors; but the opinion of the Committee was accepted that notification would impair the confidential relations of doctor and patient and that the benefits of the proposal would hardly outweigh the disadvantages. In the recent case before Mr. Gill the defendant had been treated for repeated attacks of malaria. The magistrate decided in his favour, since there had been no continuity of treatment by two doctors concurrently at the material time.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

Social Standing of Medical Students.

THE Leipziger Verband has just published figures dealing with the social standing of medical students in the Prussian Universities. The total number is 4282, including 671 women, and in the report they are divided into three categories, according to whether they come from the upper, middle, or lower classes. Children of the higher Government officials, professors, teachers with academical degrees, clergymen, lawyers, medical men, authors, officers in the army, big landowners, proprietors or managers of large factories and banks, and private employees in high positions, are placed in the first category. The second includes the children of Government officials in secondary positions, small farmers, soldiers, trades-

people, and private employees. In the third category they place the children of workmen, labourers, and minor officials. Of the men students 40·4 per cent., and of the women 52 per cent., fall into the first category, whilst in the second are 57·3 per cent. of the men and 46·7 per cent. of the women, and in the third 1·5 per cent. of the men and 0·5 of the women. (The social standing of 0·8 per cent. of the students could not be ascertained.) Thus the majority of the women students come from the upper classes, but amongst the men the middle classes predominate.

Sale of Medical Practices.

Formerly the sale of medical practices was forbidden not only by the courts of honour as being against the ethics of the profession, but also by the law courts, which often declared contracts of the sort invalid. Recently, however, these views have undergone a certain change. A Berlin lawyer, writing in the *Medizinische Welt*, says that the High Court has recently, on two occasions, declared that the sale of the practice of a deceased medical man by his heirs is valid. Sometimes it is agreed, and has been considered lawful, for the money not to be paid in one sum, but in instalments, and in some cases the vendor continues to receive a share of the income derived from the practice by his successor. The contract must not contain any provision which may tend to deceive the public. For instance, if a provision is made in the contract whereby it is agreed that the vendor's door-plate may continue to be used for a time in order to make the public believe that he is carrying on his practice, such a provision would be contra bonos mores and thus invalid. A case is on record in which a medical man purchased a practice under the condition that he would pay an excessive sum for it, and the High Court objected to the contract on the ground that it would result in the purchaser being induced to extract as much money as he could from his patients, which would be morally unjustifiable. A contract in which it was agreed that the purchaser of a practice should prescribe remedies and preparations devised by the predecessor was also declared invalid. In the eyes of the High Court the medical profession is not a trade in the usual sense of the term, but a public service. Economic questions, therefore, must take a secondary place in the government of its affairs.

The Berlin Municipal Hospitals.

The state of the Berlin municipal hospitals was lately discussed before the Berlin Society for Public Health. Dr. Korach said that the number of beds was obviously too small, so much so that during the recent spread of diphtheria it had been suggested that schools and other public buildings should be converted into hospitals. The municipal hospitals, especially the new ones, are nearly all situated in the suburbs, far from the centre of traffic, and this, according to him, is a drawback for persons injured in street accidents, who have to go a long way before they can be treated; hospitals which would deal with accidents only ought to be established in the centre of the city. Another drawback of the municipal hospitals is that, with the exception of the Virchow Hospital, they have only internal medical and surgical departments, none being provided for nervous diseases, orthopædics, or urology. There are special wards for children's diseases of which the official head is the head of the internal department; in practice, however, the head of the department is an assistant who is interested in that particular branch of medicine. Dr. Korach pleaded for the establishment of special departments, particularly for occupational diseases. Prof. Hofmann, of the municipal health office, stated that to overcome the shortage of beds a new hospital would be erected this year, that the old hospitals had been enlarged and modernised, and that a large private hospital had been taken over by the city. In the new hospitals special departments will be set up, but this was not practicable in the existing ones.

Avertin in Confinements.

At a meeting of the Berlin Gynæcological Society Dr. Hornig has reported on the results obtained with avertin in confinements. In only 75 per cent. of 180 cases has he found it effective as an anæsthetic. The drawbacks to its use were that labour pains became weaker and the second stage was prolonged. Separation of placenta was sometimes made difficult, and atonic hæmorrhage developed. Moreover, in some instances, a state of excitement was observed which was detrimental to an aseptic course of the delivery. He is therefore unable to recommend avertin for obstetrical purposes.

The Minister for Public Instruction, in agreement with the State Examination Commission, has laid it down that candidates who have twice failed to pass a part of the State examination may not take it again. He considers that candidates who have twice proved themselves unable to pass the examination, though they have had time enough in which to prepare, must be regarded as unfit to become qualified medical men.

BUDAPEST.

(FROM OUR OWN CORRESPONDENT.)

The Essentials of a Spa.

AT the recent congress of the Hungarian Balneological Society, Prof. Alexander Korányi said that the progress of science has caused a great change in the requirements which a health resort should satisfy. The modern spa must be a serious institution for treatment on a proper scientific basis. This can only be achieved under the following conditions. First, it must not be a place of entertainment; for as such it cannot be developed and face competition. It must be specialised, and accordingly must receive only patients who are likely to benefit by its particular advantages. It must be served by competent up-to-date specialist doctors, whose presence makes it possible to carry out scientific work connected with the diseases which the methods in use—e.g., baths—are expected to cure or alleviate. There must be hospitals, laboratories, and equipment to ensure that patients shall receive adequate treatment. The organisation of the place must be adapted to the requirements of the patients, and the final control must be in the hands of medical directors of the baths, without regard to the views held in non-medical quarters. An examination of foreign spas shows that the places working on these lines are the most prosperous, while those in which there is no systematic management, where the health of the patients is of secondary importance, and the interests of hotel-keepers are placed in the foreground, are incapable of meeting competition.

Problems of Psycho-analysis.

In an interview given to a medical journal, Dr. Alexander Ferenczi, president of the Hungarian Psycho-analytical Society, said that for the last year or so two important problems had been receiving the attention of most psycho-analysts—namely, analysis by laymen, and the part which should be played by psycho-analysis in education. In particular, Prof. Sigmund Freud and his adherents hold the view that the medical profession is unable to fulfil the immense task of giving the treatment required by all the neurotics, the children inclined to crime, the quarrelling families, and the workers who are inefficient owing to mental conflicts, and that therefore the services of specially trained lay analysts could not be dispensed with. On the other hand, there is a group of prominent psychologists who maintain that only a person holding a medical diploma ought to be permitted to carry out psychological research on new lines and to apply psychological methods to treatment. In Berlin, in America, and even in Paris, many prominent laymen are working in the field of psychological practice and theory. In America, great numbers of the so-called

social workers, and workers in mental hygiene, acquire competent training in the different methods of psychology. Dr. Ferenczi had the opportunity of gaining an insight into the internal life of the staff of the huge warehouse of the Macy firm, employing 10,000 persons, and was surprised to find that there are social workers, mainly well-educated women, who occupy themselves with the mental conflicts of the workers, study their intellectual tendencies, and endeavour to establish an equipoise in their family life and working condition. A group of health workers have acquired special training in nursing and looking after patients who are mentally abnormal. They have their own separate quarters, where they are consulted by those in need of their advice.

On the second question less definite conclusions have been reached, says Dr. Ferenczi, and it is a matter of keen discussion how best to utilise our psycho-analytical knowledge in the education of children and in the upbringing of the very young. One of the pioneers of the cautious combination of psycho-analysis and pedagogy is Freud's daughter, Anna Freud. Only practice and experience over many years will show what the method can effect in education.

Hungarian Rontgen Society.

The membership of this society has now risen to 167, and the scientific meetings which it organises have attracted unexpectedly large audiences. The programmes have been long and varied. Its activities are greatly assisted by the journal which it issues (the *Magyar Röntgen Közlöny*). Post-graduate courses are arranged every year. The society is arranging to produce an up-to-date treatise on the subject and hopes to arrange coöperation with foreign countries. The president is Dr. Béla Kelen, professor of rontgenology in the University of Budapest. The suggestion has been made that the authorities should be persuaded to make this subject a regular and compulsory part of the medical curriculum at the Hungarian universities.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

The Cost of Medical Care.

FOR some three years a small but influential group of physicians, economists, and sanitarians has been concerned with problems related to the increasing cost of medical care. On April 1st, 1926, following an informal conference at Washington, a committee was appointed to develop plans for a comprehensive survey of the situation. This committee has grown until it now comprises 42 persons, of whom 23 are medical graduates, and the remainder prominent economists and representatives of the public interest. The chairman is Dr. Ray Lyman Wilbur, president of Stanford University, and a past-president of the A.M.A. Dr. C.-E. A. Winslow, of Yale, is vice-chairman, and the director of studies is Dr. Harry H. Moore, whose publications on "Public Health in the United States," and "American Medicine and the People's Health," are no doubt well known in England as here. A five years' programme of inquiry has been evolved, designed to answer the three following questions:—

1. What data are now available showing the incidence of disease and disability requiring medical services, and what are the established facilities for dealing with them?
2. What do existing services cost the people and what return accrues to the physician and other agents furnishing such services?
3. What specially organised facilities for medical care serving particular groups of the population may now be found, and how do they compare in adequacy and economy with unorganised services?

Such data as have been already collected indicate that the committee is engaged on an investigation of great import. The average earnings of 30,000,000 people industrially employed were, in 1925, in the neighbourhood of $1250. Since more than one member of a family may be employed, the average family income of this class is probably around $2000. The income required to maintain a family of four in the Eastern States at the end of 1925 was estimated at $1550. That many families cannot pay their doctor's bills in time of sickness is a matter of experience as well as a valid conclusion from such figures as those above. The cost to the patient of medical service is high. For example, the *minimum* cost of maternity service by a general practitioner is, according to the Metropolitan Life Insurance Company, about $150, and a specialist's cure costs from $400 to $500. Yet the doctors do not get rich. I am reliably informed that for the small town from which I am writing the average net income of the physicians is less than $2000 a year. The expense of running an office is considerable: the amount of free work is often very high. It is said that in one large city the majority of tonsillectomies are performed free of charge. An alternative to free work and bad debts would seem to be insurance, but the profession is almost solid in its aversion to anything that resembles "State medicine." It is almost universally believed that English doctors are suffering martyrdom from this system. Is it possible that the insurance principle can be introduced without the patronage or supervision of the State? One of the studies outlined is to investigate "the extent of private medical service on a yearly basis." Others deal with such questions as organised medical service in large industries and organised health services in universities and colleges. The coöperation of the Metropolitan Life Insurance Company makes it certain that the type of health assurance which they have so successfully sponsored will also be taken into account.

HARVEIAN SOCIETY OF LONDON.

THE annual dinner of this Society was held on Thursday, June 14th, at the Connaught Rooms, London, W.C., Dr. Herbert French, the President, in the chair.

After the loyal toasts Mr. H. W. Carson, President of the Medical Society of London, proposed the prosperity of the Harveian Society, one of a triumvirate, the others being the Medical Society of London and the Hunterian Society, which escaped the great fusion whose result was the Royal Society of Medicine. Of these the Hunterian Society had been largely associated with the London Hospital, while the Harveian Society had been specially connected with St. Mary's Hospital, but the lists of membership showed that the constituent practitioners were really recruited from all schools, and in many cases men were members of two or more of the societies. The annual dinner of the Harveian Society was a function, he understood, which owed its origin to Sir D'Arcy Power and Dr. William Hill, to whom the idea occurred during their secretaryship, appositely, he thought, inasmuch as the former, as an archæologist, would see to the age of the vintages, while the latter specialised in the region of the gullet. Mr. Carson recalled to the minds of the assembly the founding of a prize in connexion with the Harveian Society by Mr. Buckston Browne in memory of his son, and then asked the company to drink the health of their Chairman, the Physician to His Majesty's Household.

Dr. French, in reply, was glad to give a thoroughly good account of the position of the Society. The number of members was going up, the financial position was sound, while the debates had been often of great interest because of the prominent part played in them by general practitioners, and this had always been a special aspect of the Society's activities. Pointing out that the toast which was to follow would receive reply from certain distinguished guests, the Chairman said that, as a matter of fact, everyone in the room was a guest, the guest of a member of the Society who desired to remain anonymous. This same open-handed member, he added, had announced

the intention not only of defraying all the expenses this evening, but of giving, now and not by testamentary disposition, a sum of money to the Society for the purposes of the annual dinner, the impulse for his generosity being the large number of friends whom he had made through membership of the Harveian Society in his early days of practice.

At this point Mrs. Kate Philips recited the humorous ballad, the "Browns of Walham Green," whose sad plight, as the result of over-attention to medical edicts laid down by THE LANCET, was followed with much amusement by the audience.

The toast of the visitors was proposed by Mr. C. W. G. Bryan, who said that in giving the health of the guests he was really putting forward over 99 per cent. of the company, whose case had been already dealt with by Mr. Carson. He briefly enumerated the principal visitors, naming the Services or Societies which they represented, and associated with the toast Mr. Augustine Birrell, Surgeon Vice-Admiral Gaskell, and Sir Henry Curtis Bennett.

Mr. Birrell, in reply, said that he had known Mr. Buckston Browne since 1861, for they had been at school together; he had dined with him frequently during that long friendship, and now it appeared he was his guest again. He had some sense of grievance he said, that the name of Harvey had never been mentioned at this dinner of the Harveian Society, because, on learning that he would have to reply for the visitors, he had read up the life of Harvey as written in the "Dictionary of National Biography" by his old friend Norman Moore. To the knowledge of the circulation of the blood thus gained he would contribute the personal observation that nothing quickened the circulation of the blood of an author more certainly than a quick circulation of his books.

Among those present at the dinner were the President of the Royal College of Physicians of London, the Master of the Apothecaries' Society, the Directors-General of the Medical Staff of the Army and of the Air Force, the Presidents of the Royal Society of Medicine, the Medico-Legal Society, the Hunterian Society, the West London Medico-Chirurgical Society, the Chelsea Clinical Society, the Regius Professor of Medicine at Oxford, the Curator of the Hunterian Museum, and the Secretary of the Royal College of Surgeons of England.

Public Health Services.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are some of the 1927 statistics of a group of districts of varying local government status:—

Name of district and estimated mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Diarrhœa, &c., under 2 years.	Maternal mortality from childbirth.
West Ham C.B. (315,400)	18·9	11·0	1·10	1·11	2·7	1·5	67/26	5·7	3·0
Leicestershire C.C. (283,700)	17·2	11·6	0·97	1·35	2·2	1·5	65	2·9	3·5
Northampton C.B. (93,260)	13·7	12·0	1·29	1·42	2·1	1·7	61/37	5·5	5·5
Cambridge B... (58,680)	13·9	12·7	0·95	1·36	3·0	1·2	55/29	2·4	0·0
Stafford B. .. (28,830)	15·8	10·0	0·83	1·11	1·9	1·3	48/26	4·4	4·4
Bentley-with-Arksey U.D. (16,170)	19·2	11·1	1·05	0·74	1·5	1·4	70	0·0	6·4

West Ham.

Dr. F. Garland Collins reports that the sanatorium, with accommodation for 40 children suffering from pulmonary tuberculosis, on Langdon Hills was opened in November. The site comprises 100 acres and is in one of the highest parts of Essex overlooking the mouth of the Thames. It is about 20 miles from West Ham and 270 ft. above sea-level. The existing farm-house has been adapted for the nursing staff and the new buildings are of the bungalow type and constructed of "Frazzi" material. This institution will obviate the necessity of sending away children to outside sanatoriums. An artificial sunlight clinic in connexion with the maternity and child welfare work was begun in 1925. During 1927, 684 patients were treated and a proposal to extend this treatment to school-children has been forwarded to the Board of Education for their approval. A dental clinic has been inaugurated for children under 5 years of age. A scheme is now before the Board of Control for the establishment at Ockenden, Essex, of a colony to accommodate 500 variously graded mentally defective persons from West Ham and other districts. The colony is so planned as to be capable of being made available for 1000 cases. Dr. Collins points out that West Ham, like the rest of the country, has felt acutely the lack of suitable institutional treatment for mental defectives.

West Ham suffered considerably from the floods which occurred in the beginning of the present year. No less than 2874 dwellings were involved, but prompt and vigorous action prevented undue hardship among the victims. Diphtheria was unusually prevalent during the year, the notifications numbering 954 and the recorded deaths 40. The council have now provided facilities for the immunisation of children.

Dr. Collins is not favourably impressed with the methods of some of the recent plants for dealing with refuse. He criticises in particular the revolving belt and the hand-sorting of all kinds of objectionable refuse. When heating or cooking is done by gas or electricity the material put in the dustbins is liable to be more noxious. Proceedings were taken against a company which dealt with the skinning of rabbits, hares, cats, and dogs, for carrying on the business of a fellmonger without a licence. The summons was dismissed with costs against the corporation, apparently as the result of expert evidence to the effect that the only animals dealt with by a fellmonger were sheep and lambs. Dr. Collins states that at one of his visits to the premises he saw an accumulation of dead cats and dogs in various stages of decomposition.

The residential open-air school for 80 boys near Ongar and the day open-air school for 60 girls did good work, and both escaped infection during an extensive epidemic of scarlet fever. Of the samples of designated milks tested 4 "Certified," 4 out of 10 "Grade A (T.T.)," 7 out of 8 "Grade A," and 31 out of 36 "pasteurised" attained their respective standards. This result was better than in the previous year.

The work done by the "home helps" employed by the council is found to be of great value in saving the mothers from getting up too soon after confinement; 1067 mothers were provided with this assistance. Of the 80 midwives who practised during 1927, only one was untrained, and she retired at the end of the year. The births numbered 5991 and 3701 were attended by midwives, who summoned medical help in 695 cases. Particulars are given of the 18 deaths from pregnancy or childbirth. Three of these were due to miscarriages in the first three months of pregnancy and in the case of one there was a definite history of an abortifacient having been taken. Of the remaining 15, 4 were sent into hospital as emergency cases and 11 were delivered at home. Three of the cases had attended the antenatal clinic, of whom one developed eclampsia suddenly, another was taken ill while away on holiday, and the third died from ante-partum hæmorrhage (probably placenta

prævia). Dr. Collins is strongly of the opinion that amongst expectant mothers the practice of taking noxious ecbolic drugs is very prevalent, and is increasing, and that the health of the mothers and the vitality of the infants is affected thereby.

Leicestershire.

Dr. J. A. Fairer divides his county by occupations into "agricultural," "industrial," and "mining and quarrying" areas. The nutrition of the school-children in the agricultural areas is the best. There was some evidence that the coal stoppage of 1926 influenced adversely the nutrition of the younger children in the colliery districts, but it was a matter of interest that the colliery districts escaped the epidemic of poliomyelitis. During 1927 there were only 9 cases of poliomyelitis notified as compared with 72 in 1926. Full investigation by Dr. J. M. Mackintosh of the present condition of the sufferers by the 1926 epidemic is included in the present report. Practically no light is thrown on the means by which the infection was spread. Of 80 cases investigated 9 died directly from poliomyelitis and 2 from bronchopneumonia during 1927. Seven recovered completely, 14 showed a mild degree of paralysis, 29 had a moderate degree of paralysis and usually wore apparatus, 11 had severe paralysis and were unable to walk without apparatus, while 8 were practically helpless and unable to walk even with apparatus. The foregoing statement applies to the condition after the lapse of one year. During 1927 the county council approved the provision of ten beds for orthopædic cases at the Manfield Orthopædic Hospital, Northampton. Four of the beds are intended for surgical tuberculosis, three for the maternity and child welfare centres, and three for the school-children. The selection of the cases is made by the honorary surgeons of the clinic at the Leicester Royal Infirmary, which institution, Dr. Fairer says, carries nearly the whole burden of hospital treatment in a county in which the voluntary spirit is strong.

Dr. Fairer makes special complaint of the tents, vans, and sheds which have come into use as dwellings owing to the house shortage and which are entirely unsuitable for the purpose. On a fine day the surroundings of these so-called dwellings are highly unsatisfactory, but on a stormy, snowy, or wet day "the state of affairs is truly appalling." It is suggested that matters might be improved by the adoption of Section 43 of the Public Health Act of 1925.

Twenty-two complaints of tuberculous milk were received from outside authorities: 22 dairy farms were visited, but only two offending cows were discovered.

Northampton.

Dr. Stephen Rowland refers to an interesting occurrence in this county borough on Dec. 7th last. A prominent citizen of the town, to mark his eightieth birthday, invited all the octogenarians to luncheon, and this brought out the fact that at least 777 residents had reached or exceeded this age. The daily consumption of milk is 5000 gallons, of which 150 are "Grade A (T.T.)," 1700 "Pasteurised," and the rest ordinary milk. Dr. Rowland refers to the fact that the milk trade is gradually coming to be regarded as one which requires special training and special premises. Towards the end of January the arrival of an influenza epidemic was heralded by the announcement that the attendance in the infants' department of one of the schools had fallen to 40 per cent. By the end of February the epidemic had passed from Northampton. The deaths attributed to it were 54, all of them at ages over 15. In the pandemic year 1918 there were 207 deaths, and a noticeable feature of the 1927 epidemic was the rapid recovery made by most of the patients. The late notification of pulmonary tuberculosis results in a longer waiting-list of patients for the "advanced" wards than for admission to Creaton Sanatorium. In 1927 the percentage of early notifications was 18, of intermediate 62, and of advanced 20, whereas in 1926 the percentage of early notifications was 36, of intermediate 48, and of advanced 16.

Cambridge.

Dr. Andrew J. Laird draws attention to the fact that 21 of the 45 infant deaths in the borough occurred during the first week of life. For the second year in succession there were no maternal deaths from childbirth in Cambridge.

A successful Health and Cleanliness Exhibition, opened by the Vice-Chancellor of the University, was held in the Guildhall, March 29th to April 2nd, and attracted about 7000 visitors. A very complete programme of lectures and films was arranged. A clean milk competition was conducted from July, 1926, to June, 1927, and attracted 13 producers and 12 retailers as competitors. Monthly samples were taken for analysis and the results were communicated at once to each competitor. The tests included total bacterial count, *B. coli* content, keeping quality, sediment, and fat content. Of the 13 producers five reached the Grade A standard for more than half the tests. The retailers did not do so well, and the conclusion was reached that milk retailed by men who also produce it is cleaner than milk bought by a retailer from someone else. "The competition," says Dr. Laird, "has proved extremely valuable."

Stafford.

Dr. J. T. Macnab mentions that housing for the poorer families of the borough promises to reach at least a partial solution if the proposal to build some lower rented houses on the new estate bears fruit. Stafford has its share of slum houses, although they are not massed together in slums. Within the last few years stables, cowsheds, and even a "duck-pen" (so called) have been seized upon by tenants, who required houses, and there are a good many occupied houses in the town to-day which are not greatly superior. If a real effort is to be made to grapple with this problem the management of the proposed low-rented houses will require special consideration, and Dr. Macnab favours the Octavia Hill system. As an example of what can be done by such a system he cites the special visitation by the health visitor of 20 houses built in 1924 for poorer families. The first section of the new sewage disposal works on the activated sludge principle dealing with one-sixth of the sewage has turned out a consistently satisfactory effluent for more than two years, and it is hoped that the remaining sections will be completed during 1928. The waste water closets which number over 2000 still continue to give trouble owing to stoppages. They are gradually being converted to ordinary water closets. In Stafford industrial smoke is small compared with domestic smoke. Dr. Macnab thinks that the present-day tendency for local authorities to urge citizens to burn their own refuse is a retrograde one. The modern destructor is especially designed to consume its own smoke, and this is not likely to be achieved in the domestic grate when the householder burns his own refuse. The domestic smoke so produced helps to soil the neighbours' washing, so that any small saving in rates is counterbalanced by extra cost of soap and cleaning materials. During the last three years over 3000 gas and electric heating appliances have been installed in Stafford.

Bentley with Arksey.

Dr. A. B. Dunne says the main industry of this urban district is coal-mining, the men being mostly employed in the Bentley Colliery, but a large number work in outside collieries and are conveyed to and fro by motor bus. The Bentley Colliery maintain two pumping stations to drain the land lowered by the colliery workings. The infant mortality-rate was 70 as compared with 98 in the previous year, and has only once before approached this figure—namely, in 1912, when it was 68. The houses in the district are brick houses of a good class usually built in pairs and about 12 to the acre, and with good-sized gardens attached. During the year the condition of the vans

and sheds in various parts of the district has created a difficult problem for the council, which has not yet been solved. The 66 notified cases of small-pox were all admitted to hospital and there were no deaths. There were 76 notifications of diphtheria as compared with 18 in the previous year. The season was an extraordinarily wet one and most of the district is below the 25 ft. contour level.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED JUNE 9TH, 1928.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 365 (last week 286); scarlet fever, 1562; diphtheria, 898; enteric fever, 62; pneumonia, 1227; puerperal fever, 59; puerperal pyrexia, 92; cerebro-spinal fever, 7; acute poliomyelitis, 8; encephalitis lethargica, 27; typhus fever, 1; dysentery, 12; ophthalmia neonatorum, 111. No case of cholera or plague was notified during the week. The case of typhus fever was notified in Stepney Metropolitan Borough, and was reported in our issue of June 16th, p. 1224.

The cases of small-pox were notified from the following 26 counties: London, 49 (Lambeth 1, Poplar 1, St. Marylebone 20, Southwark 2, Wandsworth 24, City of Westminster 1); Bedford, 4; Berks, 1 (Maidenhead); Chester, 2; Cornwall, 1; Derby, 10; Durham, 98; Essex, 1 (Leyton); Gloucester, 1; Hereford, 1; Kent, 1 (Bromley); Lancaster, 17; Norfolk, 8; Northumberland, 20; Nottingham, 12; Soke of Peterborough, 1; Southampton, 1; Stafford, 18; Surrey, 2 (Mitcham); Warwick, 6; Yorks, East Riding, 2; North Riding, 6; West Riding, 49; Brecknock, 2; Glamorgan, 21; Monmouth, 31.

The number of patients in the Infectious Hospitals of the Metropolitan Asylums Board on June 12th–13th was as follows: Small-pox, 67 under treatment, 2 under observation; scarlet fever, 1782; diphtheria, 2032; enteric fever, 22; measles, 818; whooping-cough, 146; puerperal fever, 17 (plus 17 babies); encephalitis lethargica, 122; poliomyelitis, 1; "other diseases," 26. At St. Margaret's Hospital there were 19 babies (plus 15 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 1 (0) from enteric fever, 34 (12) from measles, 6 (2) from scarlet fever, 32 (5) from whooping-cough, 27 (8) from diphtheria, 33 (5) from diarrhœa and enteritis under two years, and 42 (7) from influenza. The figures in parentheses are those for London itself.

Of the fatal cases of measles outside London, 7 occurred at Liverpool. Of the fatal cases of whooping-cough outside London, 3 were reported from Birmingham, 10 from Liverpool, 4 from Manchester, and 3 from Newcastle-on-Tyne, while Glasgow showed 6 deaths for the same week.

The number of stillbirths registered during the week was 281 in the great towns (corresponding to a rate of 36 per 1000 total births), including 47 in London.

DONATIONS AND BEQUESTS.—The late Mr. L. J. Friedlander, whose estate is valued at £145,818 with net personalty of £131,722, among other bequests, left £20,000 in trust for his sister and then to such hospitals as his executors may select, while half the residue of the property is similarly left to his executors for hospital charities.—Sir William Selby Church left £1000 to the Royal Society of Medicine and £100 to Epsom College.—Mr. Charles Edward Burnby, Sheffield, has bequeathed £500 each to the Sheffield Royal Hospital, the Sheffield Infirmary, the Jessop Hospital, Sheffield, and the Sheffield Blind Institution.—Mr. Laurence Maclaren, of Liverpool, made bequests of £17,000 to charities, including £5000 to the Royal Southern Hospital, Liverpool; £2000 each to the Liverpool Royal Infirmary and the David Lewis Northern Hospital; £1000 each to the Bootle Borough Hospital and the Royal Liverpool Children's Hospital; £500 each to the Stanley Hospital, Liverpool, and the Liverpool Home for Incurables; £300 to the Woolton Convalescent Institution; £1000 to the General Public Hospital, St. John, New Brunswick, Canada; and £250 each to the Home for Incurables and the Association for the Prevention of Tuberculosis there.

Correspondence.

"Audi alteram partem."

ENCEPHALOMYELITIS FOLLOWING VACCINATION.

To the Editor of THE LANCET.

SIR,—The statement in the interesting letter by Dr. D. Hunter and Dr. W. R. Brain in your last issue (p. 1250), that their six cases of acute meningo-encephalomyelitis "differed clinically in many respects from acute epidemic encephalitis lethargica, and showed a marked clinical similarity to post-vaccinal encephalitis," would imply that this latter affection possesses a more or less stereotyped symptomatology. That has not been my impression, and I should say that only in the most general sense can any uniformity of symptoms in recorded case reports of post-vaccinal encephalitis be postulated. Without incurring the necessity of alluding to British experience which will shortly be available in a Government report, I may simply refer to Lucksch's analysis of clinical types observed in continental cases of post-vaccinal nervous disturbance. No fewer than six types are noted and I here append them. (1) Involvement of meninges only, so-called meningitis serosa. (2) Cases associated with headache, vomiting, convulsions, pareses, and somnolence without ocular palsies. (3) Like (2), but presenting trismus or tetanus-like symptoms. (4) Like (2), but presenting ocular symptoms, and consequently approaching closely to encephalitis lethargica. (5) More diffuse forms with bladder disturbances. (6) Cases showing cord involvement mainly, and simulating poliomyelitis anterior.

Unfortunately, in many cases clinical descriptions are meagre and entirely inadequate for purposes of accurate clinical filing. It is all the more necessary, therefore, that whenever opportunity occurs, clinical records should be amplified by careful autopsy and fullest investigation of the central nervous system from the the histological and experimental point of view. Much progress may be hoped from the investigation, on lines laid down by Dr. Hunter and Dr. Brain, of anomalous types of encephalomyelitis disseminata. At the present time, however, it is in my opinion unwise to assume that post-vaccinal nervous sequelæ conform to any very hard-and-fast clinical type. Hitherto, purely clinical investigation has helped little towards the elucidation of this serious sequela. I am, Sir, yours faithfully,

J. C. G. LEDINGHAM.

Lister Institute, London, June 16th, 1928.

RECENT KNOWLEDGE OF HOOKWORM DISEASE.

To the Editor of THE LANCET.

SIR,—An editorial note to a letter of mine appearing in THE LANCET of May 19th (p. 1043) remarks that "we possess no convenient résumé in a single cover of the immense mass of recent knowledge regarding hookworm disease in various parts of the world." Commenting on this in your issue of June 16th (p. 1251) Dr. Carozzi draws attention to two publications which are evidently felt to fill the need. The first, the admirable Publication 11 of the Rockefeller Foundation, International Health Board, dated 1922, is an arranged bibliography of 5680 items, but without an index to the arrangement. It corresponds to the necessarily indigestible list of references at the end of a scientific paper, and not to the predigested summary which commonly precedes it and whose absence is clearly the matter on which you comment.

The second publication, from the International Labour Office, Dr. Carozzi believes to give a fairly complete account of the different aspects of the problem of ankylostomiasis. The first requisite of such an account is reliability. The International

Labour Office should conform to the International Laws of Zoological Nomenclature. The hookworms of man do not belong to the genus *Uncinaria*. Such designations as *Ankylostoma Dubini*, *A. Stiles*, and *Ankylostoma duodenale Dubini* (E. Perroncito) are lawless, and meaningless, or confusing. *A. duodenale* is said to have been studied by Perroncito and Railliet. The greatest name of all in this connexion is omitted, Looss, and the omission explains much. The figures given, after Perroncito, of the head end of this worm are inaccurate, and are perhaps composite figures of the two common hookworms of man, *Ancylostoma duodenale* and *Necator americanus*. Looss's drawings are unsurpassed in accuracy and artistic merit. Others, including possibly my own, follow the same line, but at an easily discernible artistic interval. At all events accurate figures are readily obtainable. That entitled "Female ankylostoma filled with eggs" actually depicts a small portion of one of the uteri. A table facilitating differentiation of the two parasites is attributed to me in 1919. I pointed out a few of these differences in 1913, but not in 1919; I do not believe that the others are correct. I claim, then, an established alibi at the time when this bastard with its embarrassing likeness to my own offspring was procreated. *A. duodenale* will not be found in the fæces if search be made for a pale, flesh-coloured, red worm. Regarding minute anatomy, the presence of the piercing teeth at the bottom of the oral cavity is unmentioned. Of the œsophagus it is said that it dilates into a muscular stomach, a statement taken from Perroncito. Of this Looss wrote 23 years ago that the description was incomprehensible. Its repetition to-day is less understandable than ever. Concerning eggs, and disregarding the slip which makes the breadth greater than the length, it is not the case that those of *A. duodenale* have a double-outlined shell, thicker and less fragile than those of *N. americanus*, that any difference in segmentation between those of the two species is discernible, that only a quarter of the eggs produced by hookworms are viable, or that their characteristic appearance prevents likelihood of confusion with those of other parasites. Nor is it the case that a saturated solution of sodium chloride preserves hookworm eggs for diagnosis, while Teleman's method of concentrating eggs for this purpose, advised in the article, has for many years been, apparently completely, abandoned as ineffective and as destructive of valuable microscopes. Culture does not necessarily reveal 99 per cent. of "carriers." It is stated that at least 20 million persons are infected. This is strictly true—but misleading, since 800 million is perhaps not an over-statement. And that being so, and there being, as I believe, no evidence that most infected persons can be dismissed as "carriers" and much to suggest that they cannot, it is regrettable that an article from an office of the League of Nations, and one dealing with so vital a subject, should fall so deplorably short of the admirable standard set, for example, by the League's publications on malaria which have forwarded knowledge in the most striking manner. I have not dealt with the whole article, but it follows, Sir, that my criticisms of it have not weakened the truth of the final sentence of my original letter or of your own comment thereupon.

I am, Sir, yours faithfully,

Ealing, June 16th, 1928. CLAYTON LANE.

A TREATMENT FOR HAY FEVER.

To the Editor of THE LANCET.

SIR,—I have had good results from a simple method of treating hay fever, which was evolved by experiment on myself. It consists in spraying the nostrils with a 1 per cent. solution of picric acid in water every day for about a fortnight before the onset of symptoms, and in giving grs. 3 of valerianate of zinc in a pill three times a day during the whole of the hay fever period. Cases which have not come under observation before the attack may be treated in the same way, but before using the picric acid it is necessary to reduce the swelling of the nasal mucosa by spraying with an adrenalin chloride solution, 1 in 1000. When picric acid is used for hay fever the spray should be a very fine one, practically a mist, and the patient instructed to keep the mouth wide open, and to breathe deeply during the process, thus preventing any of the solution from getting into the larynx. In one case, where I neglected this precaution, and was using rather a coarse spray, the patient had an attack of laryngeal spasm, and didn't like it. Considerable success has attended this treatment.

I am, Sir, yours faithfully,

Charmouth, Dorset, June 18th. T. PAGAN LOWE.

VARICOSE ULCERS: ULTRA-VIOLET LIGHT AND UNNA'S PASTE DRESSINGS.

To the Editor of THE LANCET.

SIR,—Dr. D. Colebrook's article on a comparison of treatment of varicose ulcers by ultra-violet light and Unna's paste, published in THE LANCET of May 5th, demands some comment.

1. From the addendum it is clear that most of the work was carried out with sub-erythema doses. In only 25 per cent. of the doses was the radiation equivalent to an erythema dose on normal skin. The number of doses with the water-cooled lamp was almost negligible, less than 10 per cent. It is not quite clear whether an attempt was made to treat the ulcerated surface, the edges of the ulcer, and the surrounding skin with different doses at the same time. 2. The frequency of treatment in the 31 light cases was as follows: 18 received less than two exposures a week, 4 were treated twice weekly, 7 between two and three (nearer two than three) times a week, and only 2 cases received three or more treatments per week. 3. Between exposures "no support other than that which the patient was in the habit of wearing" was allowed, so it follows that some of the ambulatory cases were permitted to walk about with no support for their distended veins.

The failure to heal ulcers with ultra-violet rays as given by Dr. Colebrook is not surprising. Surely even the greatest enthusiast has not attributed such potency to the rays, as to imagine that a varicose ulcer, possibly of many years duration, could be healed by a sub-erythema dose given less than twice a week. The work was undertaken because of the various claims for the value of ultra-violet rays in varicose ulcers. Dr. Schiller,[1] amongst others, has claimed good results, but there is little resemblance between his technique and that of Dr. Colebrook. Dr. Colebrook's suggestion that the ultra-violet treatment given by her played an unimportant part in the cases which did improve is correct, as the amount they had was negligible.

There is, moreover, a discrepancy between the first table on page 906 and the addendum. From the table it would appear that the worst ulcers were treated with Unna's paste; yet from the addendum it can be seen that the largest ulcer treated with light was so extensive that it covered three quarters of the whole leg, and was not measured. (Incidentally, this ulcer received 10 sub-erythema exposures in six weeks. Is it any wonder that it is reported as I.S.Q. at the end of six weeks? One would be glad to know whether Unna's paste was tried subsequently in this case, and with what result.) Also, the average size of the ulcers on radiation (it is true that only a portion of some may have been given light) was 22 sq. cm.; the average size of those treated by Unna's paste was 13 sq. cm.

It is not my purpose to decry the use of Unna's paste, but simply to demonstrate that from the published report no conclusions can be drawn as to the value of ultra-violet rays in varicose ulcers.

I am, Sir, yours faithfully,

London, W., June 9th, 1928. M. WEINBREN.

[1] A. E. Schiller: Leg Ulcers: their Treatment by Ultra-violet, Arch. Phys., Therapy, X Ray, and Radium, vol. viii., No. 2, February, 1927.

MEMORIAL TO DR. IRIS FOX.

To the Editor of THE LANCET.

SIR,—An opportunity arises in the proposed extension of the pathological department of the Royal Free Hospital to erect a permanent memorial to Iris Fox, who gave her life in the course of her work in that department. We wish to raise a sufficient fund to build and equip a laboratory or library for research and name it after Iris Fox. We believe that many of her friends and those whom she taught will welcome the opportunity of contributing to this fund to perpetuate her memory. A letter from the medical school has already been sent to past and present students, explaining the need for the general extension of the pathological department. It is hoped that the present communication may reach any who have been missed, and who would like their contribution to be devoted to the special Iris Fox Fund, as well as any other friends who would care to send a gift. Donations should be made payable to the "Iris Fox Memorial Fund," and be sent to Miss Lorel Goodfellow, Hon. Secretary and Treasurer, Flat 3, 28, John-street, Bedford-row, London, W.C.1.

We are, Sir, yours faithfully,

FLORENCE E. BARRETT, HILDA M. HALLIDAY,
J. HENRY DIBLE, CLEMENT E. SHATTOCK,
HILDA FOX, H. WINIFRED STURGE,
LUCY WILLS.

June 13th, 1928.

*** The proposal is, we understand, to remodel the present pathological block, which was built in 1914–15, and to add a new wing to it. The present department, which is very overcrowded, includes five qualified assistants working under the professor, some seven laboratory attendants, and a group of 12 to 20 students. The most urgent need is for a biochemical laboratory, but a new clinical laboratory is also required for students to work on their clinical cases, as well as further accommodation for research workers and for the training of assistants. It is also proposed to form a small library of books for reference and current journals, and to provide for the proper housing of records.—ED. L.

OVARIAN HÆMORRHAGE.

To the Editor of THE LANCET.

SIR,—In reporting, on p. 1221 of your last issue, a series of cases of ovarian hæmorrhage simulating appendicitis, I briefly discussed the pathology of the condition. My attention has since been drawn to Mr. Wilfred Shaw's [1] extensive observations on this subject, which make it clear that rupture of the Graafian follicle is not (as I suggested) associated with bleeding, and that the corpus luteum in its earliest stages is free from blood. His investigations show that hæmorrhage takes place during the stage of vascularisation, and rarely also during involution; its exaggeration under abnormal conditions is liable to distend the follicle and produce urgent symptoms, as in the cases described.

I am, Sir, yours faithfully,

Southend-on-Sea, June 19th, 1928. R. K. WILSON.

[1] Some Pathological Forms of Corpus Luteum. Jour. Obstet. and Gynæc. Brit. Emp., 1927, xxxiv., 300; Ovulation in the Human Ovary, its Mechanism and Anomalies. Ibid., p. 469.

A HOSPITAL FOR THE MIDDLE CLASSES.—Croxted House, West Dulwich, is being converted into a hospital of 30 beds to be devoted solely to the needs of the middle classes. It stands in grounds of between three and four acres, and owes its inception to a small body of doctors and other professional men resident in the district. It is to be called the West Dulwich General Hospital and will be staffed mainly by local medical men with the help of consultants. It is expected that patients' payments will cover the greater part of the cost of maintenance; the balance will have to be defrayed by voluntary subscriptions.

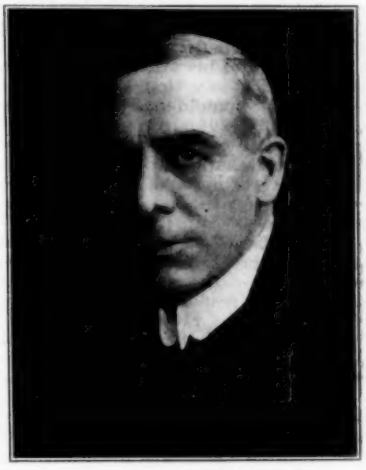
Obituary.

WILLIAM JAMES HOWARTH, C.B.E., M.D., CH.B. VICT., D.P.H.,

LATE MEDICAL OFFICER OF HEALTH TO THE CITY OF LONDON.

WE regret to announce the death of Dr. William James Howarth, until recently the medical officer of health to the City of London, which occurred on Friday, June 15th, in the sixtieth year of his age.

William James Howarth was educated at Manchester Grammar School and Owen's College. He graduated M.B., Ch.B. in 1891, and proceeded to the M.D. degree two years later. Having held resident appointments at the Manchester Royal Infirmary and at the Loughborough General Hospital, he decided to enter the public health service. He acquired the diploma of D.P.H. from the old Victoria University in 1896, and was immediately appointed medical officer of health for the borough of Bury. He held this post for two years, and was then for a brief time medical officer of health for the city of Derby and in 1908 was appointed medical officer of health and school medical officer for the county of Kent. He brought to his new post a high reputation as an administrator and this he justified in the very different atmosphere of a county health department. He developed health organisation in Kent on lines that were followed in many other areas, and there is no doubt that his work here led directly to his appointment as medical officer of health for the City of London in 1912 on the retirement of Dr. W. H. Collingridge. This post he held with distinguished success for 15 years, and his breakdown while still in middle life was a real loss to public health.



DR. W. J. HOWARTH.

Photograph by Elliott and Fry.

In connexion with the City of London Dr. Howarth necessarily held many important posts both in an active and an advisory capacity. He made his particular mark in connexion with food, and especially meat-supply, but he was an efficient officer over the whole range of his duties. He had a well-developed faculty of concentrating on the matter in hand and a clear-sighted vision which enabled him to determine what was the matter in hand. Shortly after being elected it became obvious to him that the work to which he could best devote his energies in London was that of meat inspection, which at that time, although carried out very well in a number of areas, was but indifferently done in a still larger number. The huge cattle market at Islington and the Central Meat Market at Smithfield afforded him an almost unparalleled field, of which he was prompt to take advantage. A quick worker and rapid thinker he soon mastered the problems set before him. In many instances these problems were merely those which he had met, on a smaller scale, in his earlier appointments, but his position in the City of London called for the issue of reasoned and authoritative judgments, which were duly forthcoming.

No one possessed a more intimate knowledge than he of butchers, their manners and customs, their likes and dislikes; very few officials were listened to by the butchering trade with more respect even on the somewhat thorny question of humane slaughtering. His Chadwick lectures on the Control of the Food-supply, quarries of information, were attended by crowded audiences, and the same occurred whenever he spoke in public on the Meat Regulations. On committees dealing with meat problems his services were of the first use: his work as a member of the Departmental Committee on Meat Inspection especially standing out. To the energy of this Committee are due the comprehensive Public Health Meat Regulations, 1924, which marked a decided step forward in the endeavour to secure cleanliness of the meat sold to the public, and Howarth helped to frame a scheme of meat inspection which is not only thorough but practical and workable. His reports to the Sanitary Committee of the City of London Corporation, always written after much careful observation and thought, left little more to be said, and his presence on deputations abroad to visit institutions dealing with the supply of food to this country was always welcomed by foreign colleagues to whom his knowledge and his attractive personality appealed. It is needless to say that at the Guildhall he possessed the complete confidence of the Corporation; he could rely on their support in dealing with many matters when health considerations involved difficulties for the city merchants. But while as a sanitarian he was quite fearless in dealing with the commercial community he spared no pains to be reasonable in his requirements.

The outbreak of war and the consequent depletion of his staff created many difficulties in the City health department. Howarth rose to the occasion and accepted the responsibility cheerfully which fell upon him as the chief rationing officer for London and the Home Counties. He worked unceasingly as a member of various departmental committees of the Ministry of Health and on the Board of Management of the Low Temperature Research Station at Cambridge, and the Milroy Lectures, which he delivered before the Royal College of Physicians of London in 1917 form a remarkable epitome of his multifarious knowledge on the subject. The three Lectures were published in full in THE LANCET, and to the last one there was appended a synopsis of the difficulties to be met with in the organisation of meat inspection at the time, and indications for placing that inspection on a more satisfactory basis. The future requirements were set out with a view to securing uniformity of action in a routine of meat inspection which could be made a compulsory duty on all urban sanitary authorities: the problems presented by boneless and canned meat and by imported carcasses were dealt with in particular detail, and the necessary regulations suggested for a system of meat-marking and for the investigation of the conditions in rural slaughter-houses. The lectures were exhaustive, and the lessons contained in them have been consistently applied.

There is no doubt that the years of the war tried Howarth's physical and mental capacities more than he would allow, but it was not in him to spare himself. In 1921 he was elected President of the Society of Medical Officers of Health, and worked hard in the interests of a Society with which he had for many years been conspicuously associated. But soon after the completion of his year of office his friends noticed the first signs of the insidious illness that caused his death. It became apparent that difficulties which he used to surmount with ease began to cause him needless worry. He had, moreover, to endure the death of his elder son at school, and was deeply affected by the tragedy. He could not, however, be persuaded to take the complete rest that he needed, and to this reluctance to give up work the abbreviation of his valuable career may be traced.

"My early recollections of Dr. Howarth," writes Sir William Hamer, "are of his work in a field of inquiry to which he was destined to give particular attention in the years to come, when he became medical officer of health of the City of London. In that capacity he had to advise regarding the food supplies of the London population, and he soon became *the* authority on questions concerning food, markets, cold storage, and the like; he was, moreover, always ready to impart knowledge and to give guidance and help to public health colleagues, who went into the City to discuss their difficulties with him; and such help was of special value, for from the first he strove to make the fullest possible use of the opportunities afforded him by the fact that he served an authority concerned with the greatest markets and the largest cold storage enterprises in the world. . . . As President of the Society of Medical Officers of Health he won golden opinions from all, by his courtesy, kindness, impartiality, straightforwardness, and spirit of comradeship. It fell to my lot in April, 1923, speaking on behalf of the Metropolitan Branch, to ask the president of the Society, Dr. T. Eustace Hill, to accept a portrait of Dr. W. J. Howarth, to be added to the gallery of portraits of past presidents. I remember well how the kindliness and consideration I had invariably experienced at his hands prompted me to apply to him one of the few Latin quotations at my command, and to say that Dr. Howarth's faithful study of honourable arts had beautified his character and made him incapable of any harshness of manner. I recollect, too, that an authority on poetry, and on Latin poetry, too, who happened to be present on the occasion, assured me that the quotation was most appropriate. . . . Dr. Howarth and I began our work as medical officers of the City Corporation and of the London County Council respectively in the same year, 1912, and naturally and inevitably followed the tradition of close coöperation which had been firmly established by William Collingridge and Shirley Murphy. Throughout the years of our service we travelled westwards, as Carlyle has it in his 'Life of John Sterling,' 'except in opinion not disagreeing'; though, indeed, even in opinion there was not, so far as I know, upon any matter of importance a pin to choose between us. In committee work and at conferences of medical officers of health and other gatherings, Dr. Howarth had ever in mind the interests which his great predecessor Sir John Simon spoke of as those, of the millions of population under the ravages of infectious disease, who were themselves only dimly conscious of having any interests. By-laws, General Powers Acts, tuberculosis schemes, whatever the question chanced to be, Dr. Howarth was always ready to lend a hand and do anything in his power to bring about improvement in the health of London as a whole; always having the grace to use his powers 'as ever in the great Taskmaster's eye.'"

Dr. W. G. Willoughby writes: "In William James Howarth the profession has lost a member who was instinct with the dignity of his calling, filled with the principles and practice of medicine and laudably ambitious that no path which might lead to the general welfare as objective be left unexplored. His activities ranged over the subjects ancillary to the public health branch of the profession to which he gave his best years, but especially he was devoted to preventive medicine whether on the practical, ethical, educational, or scientific side. His aim appeared to be a complete grasp of this worthiest of subjects, elusive though it must of necessity be, while at the same time his great powers of administration sought and found expression in many spheres. In chatting with him small but knotty points, one remembers his incisive settling first of the principles on which all detail must depend; the many with whom his activities in the medical societies in which he was associate or some time ruler must have experienced the benefits of his full grasp of a subject whether in laying out a thesis for debate or in constructive criticism."

Dr. Howarth leaves a widow, a son, and a daughter, and general sympathy will be extended to them in their loss. Mrs. Howarth had been a valuable ally in all his undertakings and nursed her husband devotedly through his long illness.

JOHN AYMERS MacDOUGALL, M.D., F.R.C.S.Ed.

Dr. John A. MacDougall died on June 12th at Balerno, Midlothian, aged 84 years. He was the son of Dr. George MacDougall, of Galashiels, and was educated at Edinburgh High School and University, where he qualified in 1865, becoming house surgeon in 1866 to Prof. James Spence. Dr. MacDougall practised in Galashiels until 1875, when he took the F.R.C.S. Edin. and proceeded to Carlisle, where he became surgeon to the Cumberland Infirmary while still engaged in general practice. Ten years later his health made it desirable that he should spend the winters abroad, and he decided to settle on the French Riviera. He practised in Cannes for 29 years, became Officer de Santé at Marseilles in 1890, and later acted as consulting surgeon to the Queen Victoria Memorial Hospital at Nice. In 1914 he retired from active work and returned to Scotland. Dr. MacDougall was a keen and efficient surgeon and a good diagnostician. His services were in demand all over the Riviera, and he inspired not only confidence but friendship in his patients.

Dr. A. Logan Turner writes of him: "John MacDougall possessed in an exceptional degree the clinical instinct. He was an accurate observer and he seldom made a mistake in diagnosis. 'Doing justly, loving mercy, and walking humbly,' he was a man greatly respected by the friends whom he attracted by his integrity of character, his great personal charm, and his obvious sincerity. During his retirement the periodic visits paid to him by his old associates were always a source of gratification to him. Gifted with an excellent and accurate memory he delighted in recalling the events of bygone days, and his reminiscences of the Edinburgh Medical School of 60 years ago were always interesting and instructive. As a dresser he came into close touch with James Syme, for whom he retained throughout his life a profound admiration, and whose teaching and practice of surgery he closely followed in after years. Joseph Lister during this period was working in Glasgow, and although he did not publish until 1867 his first series of cases of compound fracture treated by the new method based on the 'Germ theory' of Pasteur, rumours of his work were already filtering through to Edinburgh. To the end of his life MacDougall kept himself abreast of the modern developments in medicine and surgery, and, just prior to his death, had begun to prepare for publication his recollections of James Syme."

Dr. MacDougall leaves a widow and daughters.

The Services.

ROYAL NAVAL MEDICAL SERVICE.

The following appointments have been notified: Surg. Comdrs. G. H. Hayes to *Barham* (on recommg.); G. Carlisle to *Victory*, for R.N. Hospl., Haslar; H. F. Briggs to *Kent*, on commg.; and D. H. C. Given to *Tamar*, for Singapore Naval Base, as medical officer in charge of medical organisation and as Naval Health Officer.

Surg. Lts. C. H. Egan to *Barham*; J. Hamilton to *Kent*, on commg.; E. T. S. Rudd to *Victory*, for R.N. Barracks, Portsmouth, temp.; W. P. E. McIntyre to *Vivid*, for Plymouth Hospl.; and W. G. C. Fitzpatrick to *Bee*; A. E. Phillips to *Titania* (on relief); W. W. Darley to *Emperor of India*; and T. L. J. Barry to *Magnolia*.

ROYAL ARMY MEDICAL CORPS.

ARMY DENTAL CORPS.

Temp. Capt. W. Wormington, Dental Surg., Gen. List, to be Capt.

Temp. Lt. S. D. Badman, Dental Surg., Gen. List, to be Lt.

The undermentioned to be Lts. on prob.: J. A. O'Connor, T. R. Wall, H. L. Foulkes-Roberts, and H. S. Golding.

SUPPLEMENTARY RESERVE OF OFFICERS.

Lt. F. W. Oldershaw to be Capt.

TERRITORIAL ARMY.

Capt. J. D. M. Cardell resigns his commn.

Lt. D. T. McDonald (late Northumberland Fus.) to be Lt.

Lt. H. Miller to be Capt.

TERRITORIAL ARMY RESERVE OF OFFICERS.

Capt. A. F. G. Guinness, from the Active List, to be Capt.

Lt. J. W. Murdoch, from Active List, to be Lt.

General Hospitals: Maj. T. H. W. Alexander having attained the age limit relinquishes his commn, and retains his rank.

ROYAL AIR FORCE.

Ft. Lt. J. A. Perdrau relinquishes his temporary commission on completion of service and is permitted to retain his rank.

Temp. Capt. A. H. Mills (Dental Surgeon, General List) is granted a temporary commission as a Flight Lt. on attachment to the R.A.F.

Temp. Lt. H. D. Humphreys (Dental Surgeon, General List) is granted a temporary commission as a Flying Officer on attachment to the R.A.F.

INDIAN MEDICAL SERVICE.

Amar Nath Malhotra to be Temp. Lt.

Parliamentary Intelligence.

HOUSE OF LORDS.

THURSDAY, JUNE 14TH.

National Insurance Bill.

THE National Health Insurance Bill passed through Committee without amendment.

MONDAY, JUNE 18TH.

Government and the Deaf and Dumb.

Lord CHARNWOOD called attention to the position in industry of the congenitally deaf and dumb and of those who were wholly or partially deafened in later life by disease or accident, and to the limitations of the present provision made for their training and for securing employment for them; and asked His Majesty's Government whether they would (by means of an Inter-Departmental Committee or otherwise) inquire into the whole matter.

Viscount GAGE, replying for the Ministry of Health, said that before the Ministry came into existence a great deal of the work on behalf of the deaf and dumb was done by voluntary associations whose work was still being continued, and the Minister had no intention of interfering with their magnificent work. If they were going to apply the analogy of the machinery set up to deal with the blind to all congenital afflictions, the Ministry would have a great financial load placed upon them. The information of the Board of Education went to show that deaf children who had attended special schools provided by the Board up to the age of 16 were able to obtain and retain reasonably good and remunerative employment.

HOUSE OF COMMONS.

WEDNESDAY, JUNE 13TH.

R.A.M.C. Quartermasters as Pharmacists.

Sir WILFRID SUGDEN asked the Secretary of State for War how many quartermasters of the Royal Army Medical Corps (Territorial Army) possess the qualification of pharmacist; and whether offers from qualified pharmacists of their services in this capacity would be considered by the Army medical authorities.—Mr. DUFF-COOPER replied: None of the quartermasters at present in the Royal Army Medical Corps (Territorial Army) possesses the qualification of pharmacist. If a qualified pharmacist were recommended for appointment as quartermaster his claim would gladly be considered by the War Office. But at present there are no vacancies for such appointments.

Dispensers in the Territorial Army.

Sir WILFRID SUGDEN asked the Secretary of State for War how many dispensers in the Territorial Army held the qualification of pharmacist, and what advantage such dispensers enjoyed as regards rank over dispensers not possessing the qualification of pharmacist.—Mr. DUFF-COOPER replied: None, sir.

Tuberculosis among Members of Defence Forces.

Dr. VERNON DAVIES asked the Prime Minister what steps, if any, were being taken to examine into the question of the attributability of pulmonary tuberculosis in the defence forces to the conditions of service.—Mr. BALDWIN replied: Investigations are being made by a Committee composed of medical members of the Service departments, whose recommendations on the subject have not yet been received.

Medical Cost Accounts for Defence Forces.

Dr. VERNON DAVIES asked the Prime Minister what steps, if any, were being taken to establish a common system of costing for the medical services of the Army, Navy, and Air Force, respectively, particularly with regard to hospitals.—Mr. A. M. SAMUEL, Financial Secretary to the Treasury, replied: Cost accounts, in a common form, have been compiled for a period of three months at one Naval, one Military, and one Air Force hospital. Those accounts have been under the consideration of the Joint Medical Services Committee of the three departments. But it has not yet been decided what modifications would require to be made in the common form before it would be suitable for general adoption.

Medical Examination of Emigrants to Canada.

Mr. HASLAM asked the Secretary of State for Dominion Affairs if he could now give the number of persons rejected by the Canadian doctors as unfit for emigration to Canada from Jan. 1st to April 30th, and the number of persons who, though requested to present themselves for medical examination, gave distance, inconvenience, or expense as a reason for their inability to attend; and whether he had any evidence that these examinations were hindering emigration.—Mr. AMERY replied: The number of persons rejected by the Canadian Government doctors between Jan. 1st and April 30th was 1740. There is no record of the numbers who gave distance, inconvenience, or expense as a reason for their inability to attend. I am not prepared at present to express any opinion as to how far the new system is hindering the movement from this country, but I invite my hon. friend's attention to the report of the Immigration Committee of the Canadian House of Commons, a telegraphic summary of which appeared in the *Times* of June 8th. That report, whilst making certain recommendations for improving the new system and obviating inconveniences in remote districts, does not admit that the new system has reduced the volume of British immigration into Canada.

THURSDAY, JUNE 14TH.

Hospital Officers in the Prison Service.

Mr. ERNEST BROWN asked the Home Secretary the number of hospital officers, male and female, in the prison service; how many, in each case, were registered by the General Nursing Council as ordinary nurses or as mental nurses; and at what prisons, if any, were hospital principal officers appointed who had not qualified for State registration.—Sir WILLIAM JOYNSON-HICKS replied: There are 130 men hospital officers and 10 women hospital officers in the prison service; of the men 38 are registered by the General Nursing Council as nurses, 9 as mental nurses, and 6 are registered under both heads; none of the women are registered. There are, however, 33 fully trained women nurses employed in the prison service, all of whom are State registered, 31 being on the general register and 2 on the register of mental nurses. At the following prisons the hospital principal officer is not registered:—Men: Birmingham, Brixton, Liverpool, Manchester, Parkhurst, Wandsworth, Wormwood Scrubbs. Women: Liverpool, Manchester, and Portland Borstal Institution.

Dr. Voronoff's Visit to England.

Mr. BRIANT asked the Home Secretary if a permit had been given to Dr. Voronoff to visit this country; if so, for what period was is it available; and if such permit would allow him to carry out experiments of the nature of grafting on human beings.—Sir W. JOYNSON-HICKS replied: Dr. Voronoff was given leave to land in the United Kingdom on May 22nd and no time-limit was imposed. His object was to give certain lectures at Cambridge University and elsewhere, but no licence of any kind has been given him to experiment in this country.

Mr. BRIANT asked if Dr. Voronoff could experiment without a licence? The British public were extremely anxious to know that he should not have an opportunity of conducting dangerous and disgusting operations which included the transfer of the organs of propagation from an ape to a woman.

Sir W. JOYNSON-HICKS: It is quite impossible that he should conduct any experiment involving vivisection or cutting operations on any animal without a licence, and that licence I have not granted and do not propose to grant. (Cheers.)

Lieut.-Colonel FREMANTLE asked if a human being was not an exception, and if he could not offer himself for experiment if he liked?

Mr. RADFORD asked if it would be possible for some other licensed person to make an operation on an animal and leave it to Dr. Voronoff to complete the experiment on a human being. Did the Home Secretary note that it was a violation of everything that was decent in our constitution that this man should be allowed to conduct such experiments in this country?

Sir W. JOYNSON-HICKS: My hon. friend is really not right. No such experiments are conducted in this country at all, and the suggestion that it will be possible to have an operator who has a licence will not work, because I am most careful to inquire into the nature of the operations conducted under a licence.

Slum Clearance Schemes.

Mr. DAY asked the Minister of Health how many schemes for the purpose of slum clearance were now in operation in Great Britain; how many of these had been authorised; and the number of houses and families, and the total number of persons, who would be affected.—Mr. CHAMBERLAIN replied: 113 slum clearance schemes, affecting approximately 14,000 properties, have been confirmed since 1919 in respect of areas in England and Wales. The number of persons required to be rehoused under these schemes is 66,968. The available statistics do not show how many families are involved. With regard to Scotland, I would suggest that the hon. Member should address a similar question to my right hon. friend the Secretary of State.

Use of Croton Oil in Mental Hospitals.

Mr. CHARLETON asked the Minister of Health whether the recommendations made by the Royal Commission on Lunacy and Mental Disorder, 1926, for the control of the use of croton oil, whether for medicinal or punitive purposes, in mental institutions were receiving his attention; and whether he proposed to take any administrative or other action to deal with this matter.—Mr. CHAMBERLAIN replied: The recommendation of the Royal Commission has received consideration, but the report does not support the suggestion made in the question that the drug is used for punitive purposes. The administration of drugs of this character is the subject of frequent consultation between the Medical Commissioners of the Board of Control and the medical officers of mental hospitals, and I am advised that no further action is at present necessary.

Contributory Pensions and Mentally Deficient Children.

Mr. LAWSON asked the Minister of Health if he was aware that the mother of a child who had reached 14 years of age was deprived of its allowance under the Widows', Orphans', and Old Age Contributory Pensions Act although the child had been for some years excluded from school owing to its mental condition; and whether he was prepared to amend the Act so that a child who was medically certified as mentally deficient could continue to receive the benefit of the allowance beyond the age of 14 years.—Mr. CHAMBERLAIN replied: The answer to the first part of the question is in the affirmative. As regards the second part, I would point out that an amendment which would have secured what is now proposed was negatived when the Bill was in Committee, and I remain of the opinion that it would not be appropriate to make specific provision for this exceptional class in the contributory pensions scheme.

Sulphur Dioxide in the Milling of Barley.

Mr. WESTWOOD asked the Parliamentary Secretary to the Ministry of Health if he had received a communication from Messrs. James Proctor and Sons, Limited, barley millers, Liverpool, offering documentary evidence that the Ministry of Health (Food Preservatives) Regulations, in their application to the use of sulphur dioxide in the bleaching and preserving of barley, had completely stopped their trade, and that their previous buyers had placed their orders with foreign firms; and if he was aware that regulations prohibiting the use of sulphur dioxide in the milling of barley were at one time enforced in Germany and America, and in both countries had been withdrawn because of their impracticability; and would he be prepared to meet a deputation of millers to discuss the effects of these regulations on the barley milling trade in England and Scotland.—Mr. CHAMBERLAIN replied: I have received the communication referred to in the first part of the question. I am aware that the use of sulphur dioxide in the milling of barley is at present permitted in Germany and the United States of America, but I have no information to show that the prohibition of its use in those countries was attempted and abandoned because it is impracticable. The fact that exporters of barley to this country are able to comply with our regulations scarcely bears out that suggestion. As regards the last part of the question I would remind the

hon. Member that two deputations from the barley trade have already been received and that full consideration has been given to their representations. I do not think that any useful purpose would be served by the reception of a third deputation.

Poison Gas and Bacteria in Warfare.

Sir ROBERT HUTCHISON asked the Prime Minister whether, in view of the recommendation of the League of Nations Disarmament Commission that all subsidies, both to private and official laboratories promoting research in poison gases, should be abolished, he could say which nations had adopted these recommendations; what action the British Government had taken; whether any subsidies were now being paid to manufacturers of poison gases and bacteria; and, if so, to whom these subsidies were being paid and the amount in each case.—Mr. BALDWIN replied: Certain classes in regard to chemical warfare were included in the text of the Draft Convention drawn up by the Preparatory Commission for the Disarmament Conference at its third session, but they have not yet come forward for discussion on the Preparatory Commission. The answer to the third part of the question is in the negative.

Washington Hours Convention.

Mr. RILEY asked the Minister of Labour the names of the countries which had already unconditionally ratified the Washington Hours Convention and the names of the countries which had decided to ratify conditionally on ratification by Great Britain and certain other countries.—Sir ARTHUR STEEL-MAITLAND replied: According to my information Belgium, Bulgaria, Chile, Czecho-Slovakia, Greece, India, Luxembourg, and Roumania have ratified the Washington Hours Convention unconditionally, and Austria, France, Italy, and Latvia conditionally on ratification by Great Britain and other countries.

Deaths of Women in Childbirth.

Mr. TASKER asked the Minister of Health the percentage of deaths of mothers at childbirth where doctors attended the birth of children with uncertificated midwives in attendance; and what was the percentage of deaths of mothers at childbirth when attended by certificated midwives only.—Mr. CHAMBERLAIN replied: No complete statistics are available on these points. As regards the last part of the question I may refer the hon. Member to p. 42 of the recent report issued by my department on the "Protection of Motherhood," on which is a summary of the results of an analysis of the midwifery work of the Queen Victoria Jubilee Institute over a period of years.

Treatment of Pensioners with Chronic Disabilities.

Mr. DUCKWORTH asked the Minister of Pensions whether, seeing that many ex-Service pensioners suffering from chronic disabilities were now being referred to national health insurance for treatment, he would reconsider this decision and grant institutional treatment and allowances, in view of the hardships suffered by such pensioners.—Major TRYON replied: It is the duty of the proper medical officers of the Ministry to prescribe whatever form of treatment they may consider necessary, and in a case where no special treatment beyond attention from a general practitioner is required, the pensioner is advised to consult the practitioner whose services are available to him under the Health Insurance Acts. This is the long-standing practice of the Ministry, and I should not be justified in requiring, as the hon. Member suggests, the provision of hospital treatment in all cases regardless of medical views as to whether such treatment is necessary or not.

Board of Survey and Naval Invaliding Cases.

Mr. HORE-BELISHA asked the First Lord of the Admiralty in how many cases in the last 12 months the Board of Admiralty had overruled the recommendations of the Board of Survey in invaliding cases, and in how many cases had they overruled the decision of the commander-in-chief.—Lieut.-Colonel HEADLAM, Parliamentary Secretary to the Admiralty, replied: In 52 cases of invalidings during the year ended Dec. 31st, 1927, the opinion of the Board of Survey that the cause of invaliding was not attributable has been overruled. In no case was an award of attributability altered. No special recommendations were made by commanders-in-chief.

MONDAY, JUNE 18TH.

Medical Inspections of Emigrants to Canada.

Sir ROBERT THOMAS asked the Secretary of State for Dominion Affairs whether he was aware that there were widespread complaints, both here and in Canada, that the new system of medical inspection had antagonised the British medical profession and created an atmosphere unfavourable to emigration to Canada; and whether he would discuss this with the Dominion Government.—Mr. AMERY replied: I have seen press statements of the kind to which the hon. member refers, but I am not prepared, at present, to express any opinion as to the effect of the new system of medical inspection on the movement from this country. From the latest information in the press I gather that it is proposed materially to modify the new system.

Medical Inspection of Casual Paupers.

Mr. SHEPHERD asked the Minister of Health whether he would instruct boards of guardians to arrange for the medical inspection of casuals to be carried out in the evening before the risk of infection of clothes and bedding had been incurred, and also in order that men might be released early in the morning, and thus be given time to search for employment en route for the next casual ward.—Mr. CHAMBERLAIN replied: I am afraid that the varying conditions of staff and accommodation in the different casual wards, and the late hour of arrival of some casuals, make it impracticable to arrange that effect should be given to the hon. Member's suggestion.

Houses in Unhealthy Areas.

Viscountess ASTOR asked the Minister of Health the total number of houses demolished in unhealthy areas under improvement schemes since 1919; the number of persons displaced by reason of such clearances and since re-housed in new dwellings, and the number of improvement schemes completed.—Sir KINGSLEY WOOD replied: Up to March 31st last, the latest date for which figures are available, the number of properties demolished in pursuance of slum clearance schemes, confirmed since 1919 in respect of areas in England and Wales, was 4,841, out of 13,494 properties included in such schemes. Information as to the number of persons so far displaced by reason of these schemes is not available, but it is a requirement of the schemes that re-housing accommodation shall be provided for 65,180 persons. Up to March 31st last, 6164 new dwellings had been completed for this purpose, and a further number were in course of erection. Fifteen schemes have been fully completed and others are nearing completion.

Expenditure on Out-Relief.

Mr. THOMAS GRIFFITHS asked the Minister of Health the expenditure in England and Wales in 1926–27 and 1927–28 respectively, on out-relief to children boarded out, to persons ordinarily employed, and on other out-relief, in continuation of the 1925–26 figures for these items shown in Table 7 of the Annual Taxation Returns, Part I., 1925–26.—Sir KINGSLEY WOOD replied: The following is the information asked for: The expenditure by poor-law authorities in England and Wales in the financial year 1926–27 on out-relief to children boarded out was £251,432; to persons ordinarily employed and their dependents £15,001,350, and on other out-relief £8,661,227. The annual returns for the year 1927–28 have not yet been received, but the approximate amount spent on out-relief in that year to persons ordinarily employed (and their dependents) was £6,920,000, and on all other out-relief £8,163,000.

TUESDAY, JUNE 19TH.

Cost of Tuberculosis Treatment.

Mr. OLIVER asked the Minister of Health whether he could give the total annual cost to the nation of tuberculosis for the past four years, taken separately, and the amount of money expended during the same periods on the disposal or reclamation of slum areas.—Captain MARGESSON replied: The total expenditure in England and Wales on the carrying out of the approved schemes for the treatment of tuberculosis during each of the last four years for which figures are at present available, excluding capital expenditure, was as follows:—

Year ended March 31st—	£		£
1924	2,884,062	1926	3,157,694
1925	3,034,600	1927	3,294,991

I regret that similar information as regards slum clearance schemes is not at present available. Of the total estimated capital expenditure of £8,546,000 to be incurred on schemes which have been approved in recent years, it is estimated that about £4,551,000 has been expended to date.

QUEEN'S HOSPITAL FOR CHILDREN.—At a dinner at the Mansion House last week in support of the appeal for £100,000 for the extension of this hospital in the Hackney-road, the Duke of York, the President, pointed out that the institution deals with a larger number of cases than any other children's hospital in the kingdom. When the enlargements were originally proposed, on the eve of the war, the average annual attendance of children exceeded 80,000; it is now 147,000.

Medical News.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—A meeting of the Council of the Royal College of Surgeons was held on June 14th, Sir Berkeley Moynihan, the President, in the chair. The following examiners were elected for the under-mentioned examinations:—

Primary Fellowship.—(Anatomy) Mr. P. N. B. Odgers.
First Conjoint.—(Anatomy) Prof. William Wright and Mr. R. Bramble Green; (Physiology) Prof. E. B. Verney.
Dental Surgery.—Mr. A. T. Pitts and Mr. E. B. Dowsett (re-elected for a period of five years).

As the result of the Final Fellowship Examination for the Fellowship, held from May 17th to 31st, for which 115 candidates presented themselves, 34 candidates (32 men and 2 women) were approved. The following are the names and medical schools of the successful candidates upon whom the Council conferred the diploma of Fellow:—

A. J. W. Ahern, Melbourne and Guy's; F. G. Allan, St. Thomas's; J. C. Anderson, St. Andrew's and Sheffield; L. H. Ball, Melbourne and Guy's; J. Brumwell, Durham; J. Carver, Cork and London; A. M. Chaudhuri, Calcutta and St. Bart.'s; F. M. Collins, King's Coll., Cambridge, and St. Bart.'s; J. Elgood, St. Bart.'s; D. M. B. Evans, Cardiff and Charing Cross; C. W. Flemming, Oxford and Univ. Coll.; W. R. Forster, Melbourne and St. Bart.'s; A. C. Gairdner, Oxford and London; J. Gray, Cambridge and Guy's; W. A. Gray, Edinburgh, London, and Charing Cross; P. Hack, Guy's; A. F. Hobbs, Adelaide and London; A. Hobson, Birmingham; E. Holmes, Leeds; G. H. Howells, St. Thomas's; H. Jackson, Middlesex; J. A. James, Bristol, Guy's, and London; T. G. I. James, Cardiff and Guy's; L. C. Lancaster, Cambridge and St. George's; L. E. Le Souef, Melbourne and London; A. C. MacLeod, Middlesex; Gladys Helen Marchant, Calcutta and Royal Free; M. G. Nimatallah, Cairo and London; D. W. C. Northfield, Guy's; Constance Mary Ottley, Oxford and London; S. M. Power, London; B. G. Scholefield, Oxford and Guy's; J. H. Thompson, Univ. Coll.; and J. H. M. Walker, Univ. Coll.

The diploma of Fellow was also conferred upon three candidates who have previously passed the examination and have now attained the required age of 25 years:—

James Gore, Birmingham and London; R. L. Holt, Manchester; and F. T. Ridley, Birmingham.

The diploma of Member was conferred upon the following who have passed the requisite examinations and have now complied with the by-laws:—

D. W. Currie, Leeds; Yetta Gimpelson, Royal Free and St. Mary's; Bhavani Natarajan, Bombay; Margaret E. Peaker, King's Coll.; Edith J. L. Smith, Royal Free; G. N. Unnithan, Madras and Univ. Coll.; and Elsie E. Wright, Royal Free and St. Mary's.

At the Primary Examination for the Fellowship, just completed, 160 candidates presented themselves, of whom 50 were approved. The following are the names and medical schools of the successful candidates:—

R. L. Almond, Melbourne; M. I. Ashmawi, Cairo and St. Mary's; M. Backwell, Leeds and Middlesex; J. S. Batchelor, New Zealand and Guy's; W. D. Bedford, Leeds; H. S. Billcliff, New Zealand, St. Mary's, and Middlesex; J. D. H. Bird, King's Coll.; D. A. S. Blair, Cambridge and St. Thomas's; H. A. Brittain, Dublin and Middlesex; R. C. Brock, Guy's; T. E. Cawthorne, King's Coll.; H. L. Cleave, Bristol and Middlesex; J. H. Cramsie, Sydney and Middlesex; J. Dawson, Glasgow, St. Mary's, and London; D. N. Eppstein, New Zealand; R. H. Fish, Cambridge and St. Thomas's; R. L. Flett, New Zealand and Middlesex; J. F. E. Gillam, St. Thomas's and Middlesex; Augusta G. Harrison, King's Coll.; E. S. Harverson, Univ. Coll.; H. P. Himsworth, Univ. Coll.; M. B. Lavery, Belfast and Sheffield; E. S. Lee, King's Coll.; R. O. Lee, Cambridge and St. Thomas's; W. Leslie, Guy's; A. C. Lysaght, Bristol and Guy's; R. G. Maliphant, Univ. Coll. and King's Coll.; A. J. Mason, Otago, Middlesex, and St. Mary's; M. V. Modi, Bombay and London; H. S. Morton, Dalhousie and London; A. R. Mowlem, Otago, St. Mary's, and Middlesex; J. H. Mulligan, Aberdeen; G. H. Newns, King's Coll.; C. W. Olsen, Michigan and St. Bart.'s; M. D. Patel, Bombay, London, and King's Coll.; J. B. Pennybacker, Tennessee and Edinburgh; P. N. Ray, Calcutta and St. Bart.'s; J. G. Reid, Oxford and St. George's; A. H. Richardson, Birmingham; N. H. L. Ridley, Cambridge, St. Mary's, and St. Thomas's; M. C. Rous, Cape and London; A. Simpson-Smith, Cambridge and Guy's; G. J. Sophian, St. Bart.'s and London; V. Srinivasan, Madras and Middlesex; F. S. Tait, Birmingham and Middlesex; H. S. Thomas, Melbourne and Middlesex; T. F. Todd, Guy's; C. K. Vartan, St. Bart.'s; A. L. Webb, Adelaide, Middlesex, and London; and T. H. Wilson, St. Thomas's.

MILLION BEQUEST TO HOSPITAL.—The late Mrs. Mary Anne Fitzgerald, widow of a wealthy Englishman, has bequeathed £1,000,000 to St. Luke's Hospital, New York, for the construction of a new hospital overlooking the Hudson, as a memorial to Eli White, Mrs. Fitzgerald's father.

SOCIETY FOR THE STUDY OF INEBRIETY.—At a meeting to be held at the rooms of the Medical Society of London, 11, Chandos-street, Cavendish-square, W., on Tuesday, July 10th, at 4 P.M., Dr. H. M. Vernon will open a discussion on the Scientific Control of Alcoholism.

LONDON (R.F.H.) SCHOOL OF MEDICINE FOR WOMEN.—The prizes and certificates will be given away by Dr. Arthur Phear, at 8, Hunter-street, W.C., on Thursday, June 28th, at 4 P.M. Sir Francis Acland will unveil a Memorial Porch which has been erected in the north-east of the quadrangle.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—At the monthly meeting of the Faculty, held on June 4th, the following were admitted (after examination) as Fellows: Dr. John Craw, Whitehaven; Dr. Suryakant Bhanshankar Trivedi, India; and Dr. Andrew Morton Young, Taranaki, New Zealand.

CENTRAL ASSOCIATION FOR MENTAL WELFARE.—This Association, whose address is 24, Buckingham Palace-road, S.W., has arranged a course for persons engaged in the training of mental defectives, to be held in London from Sept. 8th to 29th. A syllabus, together with forms of application, may be had from the hon. secretary.

THE Minister of Health has appointed Lord Blanesburgh to be chairman of the Advisory Committee on the Welfare of the Blind, in succession to the late Mr. G. H. Roberts. The Committee advises the Minister on matters relating to the care and supervision of the blind, including any question that may be specially referred to them by the Minister.

ROYAL SANITARY INSTITUTE.—The annual congress and health exhibition will be held at Plymouth from July 16th to 21st, under the presidency of Viscount Astor.—A complimentary dinner to the retiring secretary, Mr. White Wallis, who has held office for nearly 48 years, is to be held at the Café Royal, Regent-street, London, on June 27th, at 7.15 for 7.30 P.M.

IMMUNISATION AGAINST DIPHTHERIA.—After considerable debate the Manchester City Council, on June 6th, decided by a large majority to promote a scheme for providing voluntary immunisation against diphtheria in Manchester Schools. Although the case-mortality has fallen, the incidence of the disease continues to increase, and about 70 deaths occur annually in Manchester from this disease. The public health committee's scheme involves the provision of toxoid-antitoxin gratis for six months to medical officers of the public health services and to private practitioners.

AUSTRIAN SPAS.—The Austrian State Publishing Office (Österreichische Staatsdruckerei), Wein I., Seilerstrasse 24, has published in the German language a reference book on "Austrian Spas," which is obtainable direct, or through any bookseller. The information contains much information of value to doctors concerning the various spas, the composition of their mineral waters and their therapeutical effects. The book has been compiled by well-known Austrian authorities, such as the University Professor, Dr. Viktor Conrad, Dr. Karl Diem, Ing. Dr. Josef Knett, Prof. Dr. Hans Horst Meyer, and Dr. Siegfried Stockmayer.

ADDRESS TO PROF. SYDNEY YOUNG.—On June 15th, at Trinity College, Dublin, an address signed by some 200 chemists in many parts of the world was presented to Prof. Sydney Young, F.R.S., who is retiring from the chair of chemistry in the University of Dublin, which he has held since 1903. Mr. W. F. Adeney, Prof. E. A. Werner, and Prof. F. E. Hackett spoke of Prof. Young's discoveries in the chemistry of distillation and of the accuracy of all his work. Mr. E. S. Gwynn, Provost of Trinity College, spoke enthusiastically of his work as a teacher in the College for the last 25 years, and Prof. Young expressed his appreciation of the honour paid to him, wishing his successor as much happiness in Trinity College as he had had himself.

WELSH BOARD OF HEALTH.—The Minister of Health has approved the following arrangements for the organisation and conduct of the work of the Board, which will henceforth consist of three members—Mr. John Rowland, Dr. Llewellyn Williams, Mr. Howell E. James. Mr. Rowland and Dr. Llewellyn Williams will continue to exercise the functions heretofore assigned to them as Deputy Controller of Insurance and Medical Member of the Board respectively. Mr. Rowland will preside at Board meetings, and will succeed Sir Thomas Hughes as Deputy for the Welsh member of the National Health Insurance Joint Committee. Mr. Howell James will become a member of the Board, and will cease to be secretary and ex-officio member of the Board.

The Gold Medal for the best candidate for entry as Dental Officer in the Royal Navy has been awarded to Surg.-Lieutenant D. W. Holgate.

THE Oxford University Press will shortly publish an English translation, with the author's latest additions, of Dr. v. Economo's "Cellular Structure of the Cerebral Cortex," the French edition of which we reviewed last week (p. 1230).

KING'S COLLEGE HOSPITAL.—In opening the annual fête at this hospital last week the Duchess of Portland said that it had been decided to take an additional house for the accommodation of nurses and to use an empty ward for child patients.

IRISH MEDICAL ASSOCIATION.—The annual meeting of this Association was held at Dublin on June 13th, the President, Dr. H. T. Warnock, in the chair. The annual report stated that on Dec. 31st, 1927, there was a membership of 390. There was a satisfactory balance in hand, but outstanding arrears amounted to over £900. The council for 1928–29 consists of the President (Dr. Warnock), the Vice-President (Mr. P. E. Hayden), and 26 representatives.

ROYAL MEDICAL BENEVOLENT FUND OF IRELAND.—The annual meeting of this Fund was held at Dublin on June 13th, with Mr. R. A. Stoney in the chair. It was reported that the number of grants made during the year had risen from 81 to 90, the amount disbursed in grants being £2071. The committee draws attention to the inadequacy of its funds to meet the demands made on it. It is stated that there are many widows and orphans of medical men living in penury and even hunger, and that infirm medical men lack the minor comforts which would ameliorate their lot.

NATIONAL BABY WEEK COUNCIL.—National Baby Week will be celebrated this year from July 1st–7th. The Council urges that special attention should be given to the problem of immunisation, the prevention of maternal mortality, and new developments in maternity and child welfare work. A conference is being organised by the National Association for the Prevention of Infant Mortality on July 4th, 5th, and 6th, and will be followed by an International Child Welfare Congress in Paris on July 8th–12th (see p. 1311). Information about the conference and congress may be had from Miss J. Halford, hon. secretary, National Association for the Prevention of Infant Mortality, 117, Piccadilly, London, W. 1.

LONDON AND COUNTIES MEDICAL PROTECTION SOCIETY.—The annual meeting of this society was held on June 13th at Victory House, Leicester-square, London, W.C., Sir John Rose Bradford presiding. In proposing the adoption of the annual report and balance sheet the chairman said that it was unnecessary to refer in detail to the successful work of the Society during the year as it was fully described in documents which had been circulated. The report contained many matters of considerable interest to the medical profession, while one of the features gratifying to the Committee was the very large number of new members, the largest in any individual year: "but," said the speaker, "when it was considered what a large number of the members of the medical profession did not belong to either of the two medical defence societies the condition of things could not yet be considered satisfactory." The work of the Society had greatly increased in the past few years, for there seemed to be an extraordinary fondness at present on the part of the public for the bringing of actions against medical men. In this connexion the speaker particularly emphasised the necessity of full use being made of X ray examinations as a protection against a large number of litigious claims. Notwithstanding the increased expenditure which the Society had incurred in recent years the total assets were only £1,000 less approximately than previously, while the financial reserves had accumulated to a very satisfactory total. New arrangements had been made with regard to insurance for damages that might be incurred, and these would decrease the expenses of the Society in future years. From the points of view alike of numbers, amount of work done, and the success in performing that work, there could be no question about the Society being in a very flourishing state, while the financial position was also satisfactory. In the course of his address Sir John Rose Bradford expressed the gratitude of the Society to its officials and solicitors for the competent way in which the increased demands upon them had been met. On the motion of Dr. C. M. Fegen the President was re-elected for the ensuing year, the proposer referring to the untiring work of Sir John Rose Bradford on behalf of the Society; all the officers were re-elected, including the auditors, Messrs. Allwork and Co., and the solicitors, Messrs. Le Brasseur and Oakley, were thanked for their conduct of the Society's business. A vote of thanks to the chairman terminated the proceedings.

Dr. Charles Gordon Moore has been appointed Physician in Ordinary to H.R.H. Princess Beatrice in the place of Sir Alfred Rice-Oxley, C.B.E., who has resigned.

STREET ACCIDENTS IN LONDON.—During the months of January, February, and March last in the Metropolitan Police area, the street accidents averaged over 284 a day, and each day three lives were lost. The total of deaths during these three months was 293, as compared with 214 in the corresponding months of last year.

WORLD'S DAIRY CONGRESS.—As we have already announced, the eighth World's Dairy Congress will open at the Central Hall, Westminster, on June 26th. The congress has never before been held in England, and more than 1000 delegates from 47 different countries will attend. Among those who are reading papers are Prof. E. V. McCollum, of Johns Hopkins University, Prof. J. C. Drummond, Dr. H. Corry Mann, Sir John Robertson, and Prof. H. R. Kenwood.

CITY OF LONDON HOSPITAL FOR DISEASES OF THE HEART AND LUNGS.—On June 12th the Duke of Connaught, who has been President of the hospital since 1872, formally opened the new block which is to house the surgical and radiological departments. Sir Alexander Butterworth, chairman of the committee of management, said that the policy of the hospital had been to keep the buildings and equipment up to the standard of modern requirements rather than to incur the cost of providing new beds. With this end in view, the Prudential Assurance Company a year ago had generously given new pathological laboratories and a research institute. Now numerous friends and well-wishers of the hospital had subscribed the funds necessary for a new surgical and radiological block. Lack of funds had prevented the committee from embarking years ago upon these much needed improvements. Sir Ernest Birch spoke of the keen interest which was taken by the Royal Family in all voluntary hospital work. The Duke of Connaught pointed out the great changes which had taken place in the treatment of chest diseases since he became President of the hospital; diseases of the heart and lungs were still responsible for approximately half the deaths and much of the ill-health of this country. Within a comparatively short term of years the surgical treatment of pulmonary diseases had attained a position of great importance. The extent to which the use of X rays for diagnostic purposes had grown could be realised from the fact that the radiological department provided 12 years ago had already proved inadequate. The hospital was now furnished with suitable surgical and radiological equipment.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

THURSDAY, June 28th.—2 P.M., UROLOGY. Operations at St. Peter's Hospital. 8.30 P.M. (at 1, Wimpole-street), Prof. Jurasz (Poznan): Paper on Movable Kidney, to be followed by a discussion.

FRIDAY.—11–12 A.M., UROLOGY. Demonstration of special instruments at 1, Wimpole-street. 2 P.M., Operations at St. Thomas's Hospital. 8 for 8.30 P.M., President's Dinner at Verrey's Restaurant.

SATURDAY.—DISEASE IN CHILDREN. Provincial Meeting at the Royal Infirmary, Leicester. 2 P.M. (in the Board Room), *Paper:* Dr. H. Stanley Banks, Senior Medical Officer, Leicester City Isolation Hospital: On the Treatment of Toxic Diphtheria by Large Intravenous Doses of Antitoxin. 2.30 P.M., *Paper:* Mr. C. J. Bond: On the Effect of Certain Radiated Sterols on the Cellular Constituents of the Blood. 3.15 P.M., *Paper:* Dr. G. Brittain Gill, Physician to Bracebrough Spa: On Calcium Deficiency and its Treatment. 3.30 P.M. (in Out-patients' Dept.), *Cases:* Dr. Astley Clarke: (1) Resolving Luetic Ascites. (2) Photographs of Apparatus for the Treatment of Acute Anterior Poliomyelitis Involving all Four Limbs. Mr. R. S. Lawson: (1) Raynaud's Disease. (2) and (3) Two Cases of Osteogenesis Imperfecta. (4) Calcaneous Deformity Showing Calcaneous Spring. (5) Anterior Poliomyelitis of Upper Arm, Showing "Shelf" Splint. Dr. J. P. Jamie: Three cases. Dr. A. E. Payne: Radiograms of Kohler's disease. Dr. J. V. C. Braithwaite: (1) and (2) Two Cases of Cœliac Rickets. (3) Lipodystrophia. (4) Hypertelorism. (5) Myositis Ossificans Progressiva. (6) Infantilism with Hypertrichosis. (7) Osteogenesis Imperfecta. 4.30 P.M., Tea in the Hon. Staff Room. 5 P.M., Discussion.

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY 49, Leicester-square, W.C.
WEDNESDAY, June 27th.—4.15 P.M., Annual General Meeting, followed by an ordinary meeting. Clinical Cases.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

INSTITUTE of HYGIENE, 28, Portland-place, W.
FRIDAY, June 29th.—3.30 P.M., Dr. C. S. Thomson: A Review of Food Legislation.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, June 25th, to SATURDAY, June 30th.—ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, Great Portland-street, W. Special clinical demonstration in Surgery by Mr. Rocyn-Jones. In Out-patients' Department at 2.30 P.M. No fee.—ROYAL EYE HOSPITAL, St. George's Circus, S.E. Special clinical demonstration in Ophthalmology by Mr. Bickerton at 3 P.M., on Wed. No fee.—WEST END HOSPITAL FOR NERVOUS DISEASES, Welbeck-street, W. Special course of lectures and clinical demonstrations upon selected cases for four weeks, 5 P.M. daily.—LONDON TEMPERANCE HOSPITAL, Hampstead-road, N.W. Practitioners' course in Medicine, Surgery, and the Special Departments, 4.30 to 6 P.M. daily (second week). Further particulars from the Secretary (Mayfair 2236).

NATIONAL HOSPITAL, Queen-square, W.C.
MONDAY, June 25th.—2 P.M., Dr. Hinds Howell: Out-patient Clinic. 3.30 P.M., Dr. Kinnier Wilson.
TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Grainger Stewart: The Diagnosis of Cerebral Tumours (2).
THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Bailey.
FRIDAY.—2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Dr. Purdon Martin: Chorea.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.
TUESDAY, June 26th.—3.15 P.M., Dr. B. E. Schlesinger: Rheumatic Heart Disease in Children.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James's Hospital, Ouseley-road, Balham.
WEDNESDAY, June 27th.—3.15 P.M., Demonstration by Dr. T. A. Ross at the Central Hospital for Functional Nervous Disorders, Penshurst, Kent.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham.
MONDAY, June 25th.—2.30 to 5 P.M. Medical, Surgical, and Gynæcological Clinics. Operations.
TUESDAY.—2.30 to 5 P.M., Medical, Surgical, Throat, Nose and Ear Clinics. Operations.
WEDNESDAY.—2.30 to 5 P.M., Medical, Skin, and Eye Clinics. Operations.
THURSDAY.—11.30 A.M., Dental Clinics. 2.30 to 5 P.M. Medical, Surgical, and Ear, Nose and Throat Clinics. Operations.
FRIDAY.—10.30 A.M., Throat, Nose and Ear Clinics. 2.30 to 5 P.M., Surgical, Medical, and Children's Diseases Clinics. Operations.
On Tuesday, at 2.15 P.M., there will be a demonstration of Medical Cases by Dr. F. G. Crookshank.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.
TUESDAY, June 26th.—3.30 P.M. (at the Jessop Hospital), Mr. Chisholm: Gynæcological Cases.
FRIDAY.—3.30 P.M. (at the Royal Hospital), Mr. Yates: Surgical Cases.

Appointments.

KELLETT, FRANK, M.B., B.Ch. Camb., has been appointed Assistant Pathologist to the Laboratories of Pathology and Public Health, Harley-street, W.
MADILL, J. T. H., M.B., Ch.B. Edin., F.R.F.P.S. Glasg., Medical Superintendent of Garlands Mental Hospital, near Carlisle.
PETERKIN, F. G. T., M.B., Ch.B. Aberd., Certifying Surgeon under the Factory and Workshop Acts for the Kirkwall District of the County of Orkney.
SINCLAIR, W. A., M.B., Ch.B. Edin., a Medical Referee under the Workmen's Compensation Act for the Orkney District.

Vacancies.

For further information refer to the advertisement columns.

Aberdeen Royal Infirmary.—Hon. Jun. Asst. Ophth. S.
Birmingham University.—Asst. Lecturer in Physiology. Also Asst. Lecturer in Biochemistry. Each £300.
Bombay, Cama and Albless Hospitals.—M.O. Rs.800–50–1000.
Bradford City.—Asst. S.M.O. £600.
Brighton, Sussex Throat and Ear Hospital.—Hon. S.
Burton-on-Trent, General Infirmary.—Sen. Res. H.S. £200.
East London Hospital for Children, &c., Shadwell, E.—Surg. to Nose, Throat, and Ear Dept.
Eastern Dispensary, Leman-street, E.—Physician.
Gloucester, Gloucestershire Royal Infirmary.—Res. Surg. O. At rate of £175.
Hackney and Stoke Newington Tuberculosis Dispensary, Kingsland-road, E.—Clin. Tuberculosis Officer. £750.
Hounslow, Heston and Isleworth Urban District Council.—Half-time Asst. M.O. £350.
Hull, City and County of Kingston-upon-Hull, &c.—Asst. M.O.H. £600.
Hull, Royal Infirmary.—Asst. H.S. At rate of £150. Also Cas. H.S. £130.
Inverness District Asylum.—Jun. Asst. M.O. £250.
Kensington, Fulham, and Chelsea General Hospital, 194, Fulborough-road, Earl's Court, S.W.—Jun. Res. M.O. At rate of £100.
Kirkwall, Balfour Hospital.—Supt. Also Surgeon and Consultant to County of Orkney. £600.
Leeds Public Dispensary.—Sen. Res. M.O. £200.
Manchester University.—Reader in Materia Medica and Therapeutics. £800.
National Hospital, Queen-square, W.C.—Hon. Surg. Asst.
Newark Hospital and Dispensary.—Res. H.S. At rate of £150.
Newcastle-upon-Tyne, Hospital for Sick Children.—Hon. Phys.
Norwich, Norfolk and Norwich Hospital.—Hon. Phys.
Plumstead and District Hospital, Plumstead High-street, S.E.—Second Asst. M.O. £350.
Preston, Biddulph Grange Orthopædic Hospital.—Jun. H.S. £150.
Preston and County of Lancaster Royal Infirmary.—H.P. £190. Also H.S. £150.
Princess Louise Kensington Hospital for Children, North Kensington, W.—Hon. Anæsthetist.
Rhondda Urban District Council.—Asst. M.O.H., &c. £600.
Royal Army Medical Corps.—Commissions.
Royal Free Hospital, Gray's Inn-road, W.C.—Jun. Clin. Assts.
Royal Naval Medical Service.—Surg. Lieutenants. £453.
St. Mary Abbots Hospital, Marloes-road, W.—Asst. M.O. £250.
Sheffield, Jessop Hospital for Women.—Three Asst. H.S.'s. Each at rate of £100.
Surrey County Council.—Deputy County M.O.H. Also Asst. M.O. £1000 and £600 respectively.
Swansea County Borough.—Asst. Dental S. £450.
University of London.—External Examinerships.
Willesden General Hospital, Harlesden-road, N.W.—Res. H.S. At rate of £100.

The Chief Inspector of Factories announces the following vacancies for Certifying Factory Surgeons: Banchory (Kincardineshire), Stretford (Lancashire), Salford (Lancashire), and Islington (County of London).

Births, Marriages, and Deaths.

BIRTHS.

BEATH.—On June 7th, at Elmwood, University-terrace, Belfast the wife of Dr. R. Maitland Beath, of a daughter.
BUCHANAN.—On June 10th, at a maternity home, Lincoln, the wife of Dr. D. S. Buchanan, Navenby, Lincoln, of a daughter.
CURWEN.—On June 17th, at Medina Villas, Hove, the wife of Dr. E. Cecil Curwen, of a daughter.
FORD.—On June 11th, at St. Mary's-street, Stamford, Lincs., the wife of Dr. J. Norman C. Ford, of a son.
LANSDOWN.—On June 15th, 1928, at 106, Woodcote Grove-road, Coulsdon, to Ermyn, wife of R. B. P. Lansdown, M.B.—a son.

MARRIAGES.

ADAMS CLARK—SMITH.—On June 12th, at the Church of St. Bartholomew the Great, Smithfield, London, Dr. Willoughby Adams Clark to Ruth Ashton, eldest daughter of Mr. and Mrs. Edgar Smith, of Stoneygate, Leicester.
BARROWMAN—BURN.—On May 24th, at Penang, Straits Settlements, Dr. Barclay Barrowman, of Klang Selangor, F.M.S., to Marguerite Emily (Peggy), younger daughter of Sir Joseph and Lady Burn, of Rydal Mount, Potters Bar.
CRAIG—BELL.—On June 12th, at Holy Trinity, Brompton, Nicholas S. Craig, M.D., of Cheadle Hulme, to Frances Molly Bell, of Burton-on-Trent.
SHEPPARD—MARSHALL.—On May 12th, at the Cathedral, Rangoon, Arthur Lewin Sheppard, Major, Indian Medical Service, to Edith Treliving Marshall, M.B., B.S., daughter of Mr. W. A. Marshall and Mrs. Marshall, of Brighton, Sussex.

DEATHS.

HOWARTH.—On June 15th, at Elvaston, Gerrard's Cross, William James Howarth, C.B.E., M.D., for 15 years medical officer of health for the City of London.
HUNT.—On June 13th, at "Windermere," Sheen-road, Richmond, Surrey, Lewis Gibson Hunt, M.D., J.P.
MACDOUGALL.—On June 12th, 1928, after an operation, John Aymers MacDougall, M.D., F.R.C.S.E., of The Hill, Balerno (formerly of Letterewe-Cannes), in his 84th year.
PRESTWICH.—On June 10th, suddenly, Frank Greenhalgh Prestwich, M.R.C.S., L.R.C.P., of Osgathorpe House, Osgathorpe, Leicestershire, aged 36 years.
WEBB.—On June 9th, at Hillfield-avenue, London, N., Dr. Hugh George Webb, aged 92 years.

N.B.— A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

AN INTERNATIONAL SOCIAL WELFARE FORTNIGHT.

PUBLIC health and social welfare have drawn closer and closer together in the last 50 years, and at the present moment it is a difficult task to define the boundaries of the one or the other. The Latin-speaking countries do not attempt it; they have a comprehensive term "hygiène sociale," covering many activities which in English-speaking countries might be classed in either category. Public health workers will find much to interest them in the programme of the forthcoming International Social Welfare Fortnight, which will open in Paris on July 1st. During its progress four great international congresses will hold their meetings in succession, so that the delegates to each will have an opportunity of meeting those who are working in fields closely allied.

On Sunday, July 1st, there will be a joint inauguration ceremony, to which delegates to all the four congresses are invited, and the President of the French Republic will himself open the proceedings. On July 2nd the International Housing and Town Planning Congress[1] will open at Sorbonne. Among the subjects on the agenda are house-building costs, rural housing, housing of the poor, the mass and density of building in relation to open spaces and traffic facilities, and the difficulties in the way of town and regional planning. The second congress to meet will be the International Congress on Statutory and Voluntary Assistance, organised by a permanent international committee, which has held periodic meetings since 1889. The sessions, as well as those of the two congresses mentioned below, will be held in the new Salle Pleyel. The subjects on the agenda include the substitution of prevention for relief, the relief of foreigners, the "new poor," the aged, and the mentally defective—problems which have been acute during the post-war period of distress through which many European countries have passed. The International Child Welfare Congress will open on July 8th. Its sessions will coincide with those of the International Conference of Social Work, but will be so arranged that delegates may attend both conferences if they choose. Among the subjects on the agenda are maternity homes, breast-feeding, open-air institutions for children, social work for children, and the working of children's courts. Finally, the first International Conference of Social Work will also open on July 8th. The programme includes general organisation of social work, training for social work, methods of social case work, social work and industry, and social work and public health. The Conference over which Dr. Alice Masarykova will preside will hold plenary sessions in the mornings, and in the afternoons will divide up into five sections. Already national committees are working in 26 countries in connexion with this conference, and a large number of delegates are expected, including several hundreds from the United States. Soviet Russia is to be represented by Dr. Semachko, People's Commissar of Health, Moscow. In connexion with these congresses an international exhibition of housing and social progress will be held in the Parc des Expositions at the Porte de Versailles, from June 17th to July 17th.

[1] For particulars apply to Mr. H. Chapman, 29, rue de Sévigné, Paris, 3e.

PERCEPTION OF ACID TASTE.

THE tongue is usually held to be a fairly sensitive judge of acidity, and it is interesting to note that two workers in the Argentine, A. Berlatzky and T. Guevara, have investigated the relation between acid taste and actual hydrion concentration. They found that the limiting concentrations of pH for perception of acid taste were: sulphuric acid, 2·9; nitric, 3·2; citric, 3·9; tartaric, hydrocloric, and lactic, 4·3; acetic, 4·5; phosphoric, 4·7. Mineral acids, by reason of their greater dissociation and consequent greater hydrion concentration in solutions of equal alkali-neutralising power are well known to have a more markedly acid taste; but it might perhaps have been expected that the pH limit of perception of sourness would be the same for all acids. Berlatzky and Guevara suggest that the negative ions (e.g., sulphate and nitrate) have antagonistic action. Sulphate ions have a more depressant action on the nerves than chloride ions, as shown by the fact that concentration limit of the bitter taste of magnesium sulphate is higher than that of magnesium chloride.

This information appears to be new. In International Critical Tables there is a table of the relative sweetness of various substances and some quantitative information on odours, but none on the perception of sourness. This field may be commended to the experimental psychologist.

THE ART OF FLYING.

Captain Norman Macmillan, in a book entitled "The Art of Flying," has touched lightly upon many points of interest, dwelling not too deeply upon any one subject. Those seeking to acquire an insight into the general progress of aviation will enjoy reading it. Paragraphs here and there deal with medical aspects of aviation. Most of the statements made are reasonable and show common sense, although a few border upon the fantastic. The pilot of to-day must possess good physique, true perception (visual acuity and visual judgment), accurate power of performance (neuro-muscular coördination), combined with a temperament which fits him for flying. The first three of these essentials can be estimated by tests employed in the Royal Air Force Medical Service. The standardisation and interpretation of the results of all the special medical tests involved in the routine examination of personnel, whether for combatant service or civil passenger flying, are based upon the attributes of those aviators who, in the estimation of the responsible executive branch of the Service, proved themselves men of stamina, resource, and initiative during the war. Whether or not a candidate possesses the "flying temperament" cannot be judged from the results of any system of experiments or tests in use at the present time the decision remains, in the phraseology of the Service, "a question for the executive."

THE SIMPLEX ASEPTIC CLINICAL THERMOMETER.

Messrs. Coates and Cooper, 41, Great Tower-street, London, E.C., have put on the market a clinical thermometer which is contained in a metal case, 4½ inches long and about ⅜ inch in diameter, the case being retained in the pocket by a clip similar to those used for fountain pens. Within the case an antiseptic fluid surrounds the thermometer when not in clinical use, and means are provided for ascertaining whether the fluid is drying up or not. Without removing the container from the pocket the thermometer is easily withdrawn and replaced, while provision is made against leakage. The complete instrument is as easy to carry as a fountain pen, and the thermometer itself is completely protected and made aseptic.

ANTIMONY AND IPECACUANHA IN MALIGNANT DISEASE.

Prof. R. Minervini, of the University of Naples, who is senior surgeon to the hospitals in that city, is one of those who have a firm belief in the parasitic nature of the blastomata and considerable faith in the possibilities of chemotherapy. He has conceived the idea that parasitic agents, though they may not be found in developed tumours, may at one time have been present, and have promoted or stimulated the cellular proliferation which then continues unchecked, just as an ovum, once fertilised, develops into the blastoderm and embryo. According to his theory, if it is possible by chemical means to arrest the segmentation of the ovum, it should not be impossible to arrest in the same way the cellular proliferation which constitutes malignant tumours. Prof. Minervini has attempted patiently for many years to influence the growth of cancer in the human species and in animals by the action of many metals and metalloids in various forms and combinations. In his hands salts of antimony, especially the potassio-tartrate, have had a beneficial effect, and emetin has also had some influence, especially on deposits in glands when a total extract of ipecacuanha root was used. Prof. Minervini has combined these two agents in a compound under the name antiblastoma, and has used this largely both in hospital and private practice.[1] The remedy is prepared in two forms, a dilute solution for intravenous injection and another preparation for direct or parenchymatous injection, both methods being used simultaneously where possible. Prof. Minervini claims that under this treatment all forms of cancer of whatever organ and whatever stage show considerable retardation in their course; that the most important morbid manifestations such as pain and hæmorrhage are diminished or arrested, that ulcerations show signs of healing, and cachexia disappears. He states that in some cases the tumour was reduced in size and converted into a hard inert mass. Any fresh and bona fide attempt to find some therapeutic agent wherewith to combat cancer deserves attention, but we need not point out that of clinical impressions as to improvement following medicinal measures in cases of malignant disease must be subjected to critical inquiry before they can be accepted.

[1] La Riforma Medica, May 21st.

THE SURGERY OF YESTERDAY AND TO-MORROW.

To the Editor of THE LANCET.

SIR,—Mr. A. S. Blundell Bankart rather understated his case in the letter published in THE LANCET last week. The sentence he quotes from Erichsen's tenth edition, 1895, appears also in the eighth edition, 1884, 11 years earlier.

I am, Sir, yours faithfully,

June 15th, 1928. H. CAMERON KIDD.

COPPER AS A CONSTITUENT OF A HARROGATE WATER.

To the Editor of THE LANCET.

SIR,—In the course of research into the minor constituents of the Old Sulphur and the Chloride of Iron waters of Harrogate, I have definitely isolated a small quantity of copper from the latter source. The discovery is not original, for C. H. Bottomley, in 1880, recorded in an analysis of this water a trace of copper, which has not been confirmed until now. Since it is possible that every constituent, however small in quantity, plays a part in the pharmacology of a medicinal water, I was especially interested in an account in THE LANCET of May 19th from one of your American correspondents of some results obtained by Dr. E. B. Hart and his colleagues, in which anæmic rats were cured when a diet containing ferric chloride and a trace of copper was administered. They suggest that copper may be necessary as a catalyst in the formation of hæmoglobin. Geologically the presence of copper is of importance.

Until recently all the writers on the Harrogate waters have concluded that their origin was in rain water which is believed to percolate to the salt beds, and to reappear at the surface richer in mineral content. Prof. A. Gilligan, who has made a report on the probable relationship between the ore veins in the district and the mineral waters, holds that the waters arise from the depths of the granite and igneous magmatic rock forming the earth's interior. Heat and release of pressure allows a portion to percolate up through the sedimentary rocks, the Harrogate roadstone series, bringing up the saline materials. The finding of copper is evidence in favour of this theory—viz., that the Harrogate waters are "new" and do not depend in any way on rainfall.

I am, Sir, yours faithfully,

A. WOODMANSEY.

Royal Baths Laboratory, Harrogate, May 21st, 1928.

THE CHILD'S DOSSIER.

A MOTHER'S memory of her children's illnesses is a notoriously inaccurate source of information, from the doctor's point of view, and there are many instances in which a physician would be helped by a reliable record of a child's previous health and physical progress. Dr. Ruh and Dr. Garvin have provided a book,[1] attractively printed and bound, which is devised to encourage a mother to keep such a record. It may be questioned whether a busy practitioner, however willing to coöperate, will readily find time to fill in the various forms provided for his use—tests for protein sensitiveness, record of serum administration, laboratory findings, analysis of urine, and so on. The record covers the period from birth to 14 years, and landmarks to be recognised at points in the first six years are tabulated, with the caution that there is great variety of development among normal children. The child here taken as the average is certainly not advanced, since it is not till five years that he is credited with ability to count four objects, and only at six years with a knowledge of the letters of the alphabet. Such a record intelligently and conscientiously kept might be of value where a doctor sees a delicate patient for the first time or in helping him to fill up official forms for school or college, or for life insurance applications, while for the mother it will have a sentimental value of its own. The person who should never be allowed to see it in childhood is, of course, the child whose history it records.

SEX IN PARASITIC WORMS.

THE *Schistosomidæ* are the only group of trematode worms, parasitic in vertebrates, in which the sexes are separate and structurally very different in the adult stage. The development of this differentiation in *Schistosoma japonicum*, the blood fluke of Japan and China, has now been worked out by Mr. A. E. Severinghaus.[1] The eggs are laid by worms in the venules of the human intestinal mucosa and find their way into the bowel. Outside the body, each egg hatches into a free-swimming ciliated miracidium which has to find a specimen of one of the limited number of fresh-water snails which can act as a secondary host. If successful it bores into the tissues of the snail and forms a sporocyst, from the walls of which parthenogenetic eggs are formed: these develop into the cercariæ which leave the snail, burrow through the skin of the mammalian host, if they can find one, and pass to the portal blood system, where they develop into the sexual adults; up to this stage no sexual differentiation is perceptible. Using the hamster as an experimental animal, the author shows that all the cercariæ from a single miracidium are of the same sex—i.e., that sex is determined in the sexually produced egg and remains unaltered by the asexual generation which is interposed in the life history. Any one snail is commonly infected only by a single miracidium; hence, to be successful from the worm's point of view, a human infection must consist of cercariæ from more than one mollusc. The author adds some very interesting details about the influence of one sex on the other. In an animal infected with males only, the worms develop quite normally. But if only females are present, they grow slowly and very imperfectly and the reproductive organs hardly develop at all; if, later on, male cercariæ are introduced, the females rapidly go on to complete normal development and reproduction. One is reminded of the way in which a sexually indifferent oyster may be determined to maleness by the propinquity of a female.

HYPERPROTEINÆMIA.

HYPERPROTEINÆMIA is a very rare condition, and only a few cases have been published in the literature. The list has lately been increased by an account[2] of a case associated with multiple myelomata, in which careful analysis of the plasma proteins was made. The patient was a man of 40, with multiple myelomata of the plasma-cell type, involving the skull, ribs, spine, clavicles, pelvis, upper extremities, and femurs. Radiograms showed rarefaction with punched-out areas, and diagnosis was confirmed by histological examination of a piece of tumour excised from the femur. The urine showed a heavy cloud of albumin, with red and white corpuscles, and casts, while Bence-Jones protein was repeatedly demonstrated. Suspicion that plasma fibrinogen was high was aroused when an attempt was made to take a sample of blood for the estimation of the blood calcium, and it was found almost impossible to get any serum from the blood because the clot failed to retract. Subsequent analysis of the plasma proteins showed that they were increased to 13 per cent., which is twice the normal concentration. This increase was found to be chiefly in the euglobulin and slightly in the fibrinogen. A small amount of Bence-Jones protein was thought to be present in the plasma as well as in the urine. The authors point out that the Bence-Jones protein is chemically and immunologically quite distinct from serum and tissue proteins, and suggest that the increase in the globulin and fibrinogen fraction may be in the nature of a reaction to foreign protein such as is known to occur after the introduction of foreign proteins in animals, as in the production of diphtheria antitoxin in horses. They suggest that this and similar cases of hyperproteinæmia may be explained on the basis of systemic reaction to foreign protein.

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[1] The Child's Development and Health Record. By Harold O. Ruh, M.D., and Justin A. Garvin, M.D. London: W. Appleton and Co. 1928. Pp. 107. 10*s.* 6*d.*

[1] Quart. Jour. Microsc. Science, 1928, lxxi., 653.

[2] Hyperproteinæmia Associated with Multiple Myelomas. By W. A. Perlzweig, Ph.D., George Delrue, M.D., and Charles Geschickter, M.D. Jour. Amer. Med. Assoc., 1928, xc., 755.

BELFAST HOSPITAL FOR SICK CHILDREN.—Work is about to be begun upon the new buildings of this hospital, which is designed for 60 beds, 16 more than in the old buildings. There is no possibility of extending the present hospital or of improving methods of treatment. Although a site of five acres has been given by the Belfast Corporation the cost will be £100,000.

FUNDS FOR CANCER RESEARCH.—Towards the sum of £300,000 which the Council of the Lancashire, Cheshire, and North Wales Cancer Research Campaign hope to raise, £103,078 has so far been subscribed. The Public Health Committee of the Manchester Corporation have decided to recommend the city council to make a grant of £1000 towards the fund. It is hoped that other municipalities will followed Manchester's example.